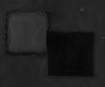
ELECTRICAL WORLD

N. E. L. A. CONVENTION NUMBER
MAY 30, 1931



+ In Atlantic City the utilities will look through the present depression and make plans for more business +

National electrical markets are now only half saturated
+ + + a new marketing policy impends

Industry earnings and credit standing are affected little
+ + + security stabilization important

New engineering developments promise further economies
+ + + assembly of standardized units grows

Is the utility political agitation to be a campaign issue?
+ + + electrical industry seeks a policy

Anti-merchandising clamor based on misunderstandings
+ + + utilities must pioneer appliances

+ Private enterprise and initiative can continue to improve our electric service and reduce costs under fair regulation

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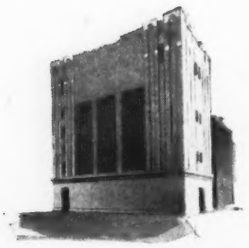
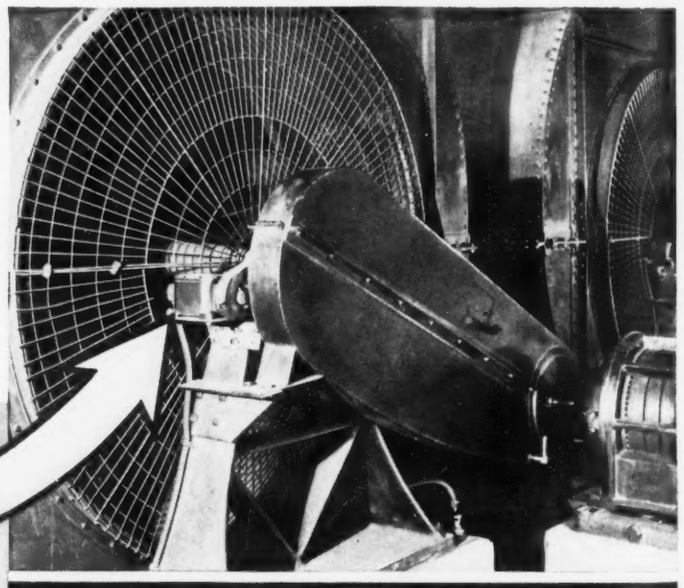


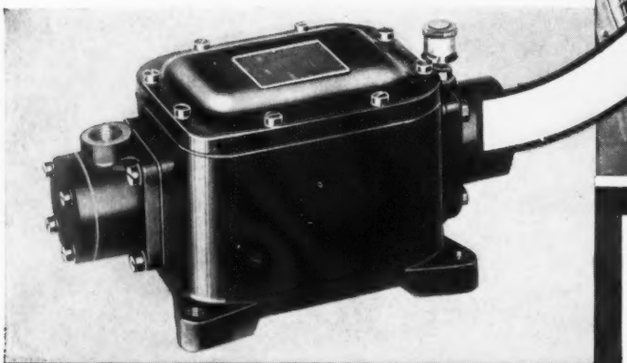
DETROIT-CANADA TUNNEL

VENTILATION SYSTEM

depends on

WESTON TACHOMETERS





• Weston tachometer installation in the Detroit-Canada Tunnel

• Model 44 Magneto—as used in the Detroit-Canada Tunnel (Types and sizes available for other requirements)

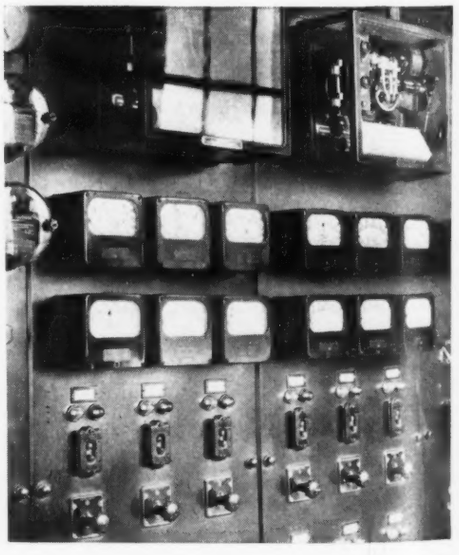
• Dependable, unfailing ventilation is vitally necessary in the Detroit-Canada International Tunnel which stretches 5,135 feet of automobile roadway under the Detroit River. Carbon monoxide gas from automobile exhausts must be removed and fresh air supplied.

Every precaution is taken to insure the reliable operation of the ventilation system. Twenty-four giant fans are used with two sources of both power and control—one at the Canadian end and another at the Detroit end.

The speed of the fans, both in Detroit and Canada, must be known at all times at the operating end. This requires two fan-speed indicators, one in Canada and the other in Detroit, operating from each fan.

Because of the requirement for multiple-remote speed indication plus the absolute necessity of reliable, accurate performance, Weston Electric Tachometers were selected.

If you have a speed indicating problem, regardless of its character, we suggest you confer with the Weston Engineers.



• One of four panels of Weston Speed Indicating Instruments with scales calibrated in "Per Cent of Full Speed" at the Detroit-Canada Tunnel

WESTON ELECTRICAL INSTRUMENT CORP.

578 Frelinghuysen Avenue **Newark, N. J.**

[Weston Electric Tachometers are standard speed indication equipment in the marine, railway, industrial and aviation fields]

ELECTRICAL WORLD

A consolidation of Electrical World, Electrical Engineer and American Electrician

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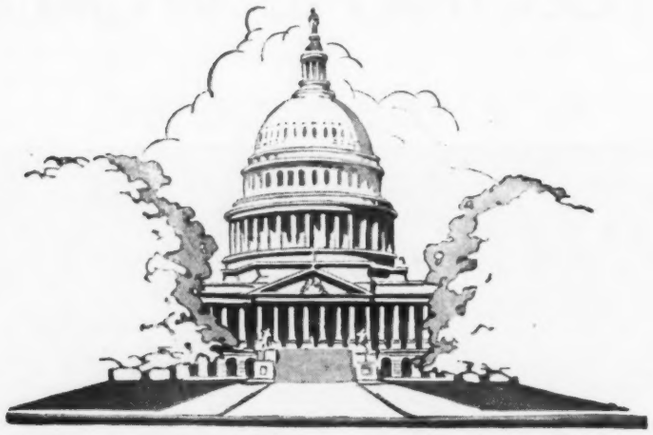


SHARING PROFITS WITH THE CONSUMER

By the terms of an agreement entered into between the Public Utilities Commission and the Potomac Electric Power Company which was decreed by the Supreme Court of the District of Columbia on December 31, 1924, all consumers of electricity in Washington and nearby Maryland virtually became shareholders in the resulting prosperity of the Company. This Agreement and Decree provides a profit-sharing instrumentality advantageous to the public and Company alike. It affords a practical and convenient method for the prompt readjustment of rates as conditions change from time to time, thereby avoiding the expense, delays and annoyances of tedious valuations, rate hearings and court proceedings.

During the seven years in which this profit-sharing plan has been in effect, substantial yearly savings have been passed on to our customers in reduced cost of their electricity. In 1924 the primary household lighting rate in Washington was 10c per kwh. Today it is only 4.2c per kwh, a reduction of 58%. Our auxiliary schedule for electric current for any purpose other than lighting in the home brings about a further reduction to a rate of only 2.1c per kwh after the first ten kilowatt hours' monthly consumption. Other schedules have been correspondingly reduced.

Washington is a city of beautiful Government and private buildings, wonderful parks, national shrines and splendid homes. Large industrial development, with its corresponding increased electrical load, is not among the direct possibilities of the future in the city of Washington proper.

Through the partnership plan now existing between the consumer, the public authorities and the Company, our unusual rate structure is singularly beneficial to the householder, the merchant, shopkeeper, small manufacturer, the Federal and District Governments. That it is successful is reflected in the results attained and the friendly attitude of the consumers of electricity.

We shall be pleased to send you upon request, literature concerning the Consent Decree which has placed this Company on a profit-sharing basis with its customers and which has received nation-wide commendation.

TABLE OF RATE REDUCTIONS

1924 . . .	10c	per kwh.
1925 . . .	7.5c	" "
1926 . . .	7.0c	" "
1927 . . .	6.25c	" "
1928 . . .	5.9c	" "
1929 . . .	5.2c	" "
1930 . . .	4.7c	" "

1931

4.2c

per kwh.

POTOMAC ELECTRIC POWER CO.

WASHINGTON, D. C.

William F. Ham President

"Matchless Service"

ELECTRICAL WORLD

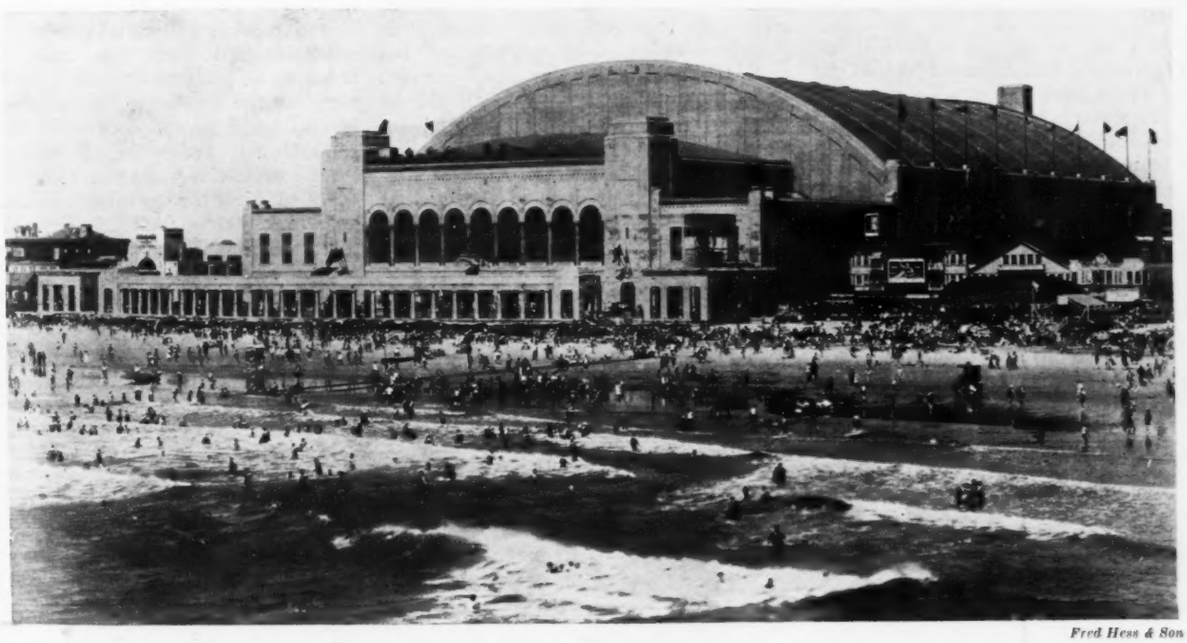
for the Week Ending

May 30, 1931

Pennsylvania Senate blocks Pinchot reforms

Beauharnois to be a Canadian scandal?

Atlantic City awaits the N.E.L.A.



Fred Hess & Son

—**Engineering may be changed** as standardization which will reduce equipment costs and permit manufacturing economies and factory assembly makes its bow. Mass production idea if accepted may offer industry revolution—*p. 1000.*

—**Developing the home market** means as a goal the all-electric household. Commercial leaders are trying out some refreshing new schemes; perhaps one of them will prove the "open sesame" that's needed—*ps. 997, 1009, 1030.*

—**Building public good will** is becoming an increasingly important problem for the electric light and power industry. Here is a plan calculated to smooth the ruffled feelings of a nation through local and national action—*p. 1021.*

Pinchot Defeat Certain as Pennsylvania Legislature Prepares to Adjourn

PENNSYLVANIA'S fighting Governor, Gifford Pinchot, as the ELECTRICAL WORLD went to press, had seen the defeat of all his plans for immediately revolutionizing the Public Service Commission of that state. With the day of adjournment fixed for Thursday, there was great activity in both houses this week over what has been the outstanding issue of the session. The proceedings of the rival investigating committees and the denunciations uttered by the Governor have been reported in previous issues.

Not only did the Senate on Tuesday decline, as anticipated, by a vote of 30 to 20, to concur in the House amendments to the Howell bill, noted last week (page 936), and send them to conference, whence they failed to emerge, but the House itself, in a totally unexpected action, consented to eliminate from the alternative Senate bill, the McClure measure (May 16, page 892), an amendment giving the Governor authority to dismiss members of the commission at will.

This provision had been the crux of the dispute in its last stages, and with it eliminated the McClure bill was thought likely to pass both houses, but on Wednesday the House reversed its action (then said to have been merely a parliamentary maneuver) and killed the McClure bill by recommitting it to the committee on public utilities by 106 to 86. Recommittal dissipated the last hope for enactment of any remedial public service legislation at this session. Enactment of the bill would have brought about the changes in the public service law suggested by the judiciary general committee of the Senate as the result of its inquiry.

The Governor is freely blamed for the failure of the two houses to adopt any compromise. He has more than once threatened that if his own commission program met defeat he would call a special session next year and resubmit it in the political atmosphere that precedes a presidential nominating convention.

▼

Canadian Parliament to Investigate Beauharnois

A COMMITTEE OF THE Canadian House of Commons will investigate the Beauharnois Power Corporation, its various subsidiaries and its scheme for development of hydro-electric energy by the construction of a canal to divert a portion of the flow of the St. Lawrence River between Lake St. Francis and Lake St. Louis in the Province of Quebec. This outstanding determination emerged on May 20 in the course of a debate in which the whole Beauharnois development was held up as a gigantic scheme to secure to private interests the entire flow of the St. Lawrence River at that point for power purposes. Allegations of fraud, misrepresentation and improper dealing; charges that members of the Dominion Senate were interested in the power scheme, and intimations that the Beauharnois corporation had even gone so far as to attempt to corrupt members of the Quebec judiciary were features of a discussion which focused the attention of the House during an animated debate.

Specifically, it was alleged that the company is proceeding illegally with a development for which it has never received the approval of the government. The construction which it has in progress differs, it was claimed, in important degree from the plans which the order-in-Council of the late Liberal government approved. The charges were raised by Robert Gardiner, Progressive leader, who urged that the undertaking because of the features allegedly connected with it should be taken over by the government and developed for the general good of the citizens of Canada.

Prêmier Bennett, beyond stating that the company had unquestionably exceeded its authority in the size of the canal it was constructing, did not enter into the controversy. He merely reaffirmed his position of a year ago, when he had held that there should be an inquiry and promised that there would be one now. During the debate, Leslie Bell, Conservative member for St. Antoine, Quebec, offered the only defense for the company by suggesting that the attack upon the Beauharnois Corporation was inspired by power interests opposed to it.

The expectation is that it will be a week or two before the investigation gets under way.

▼

Hoover Dam Construction Transmission Line Finished

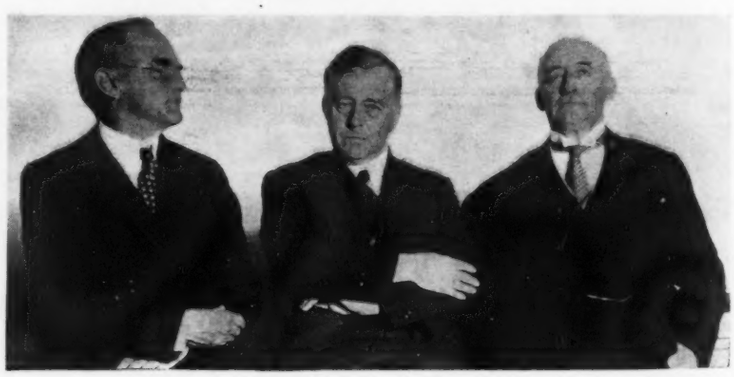
FROM VICTORVILLE, CALIF., to the site of Hoover Dam the 193-mile, 132-kv. steel-tower line of the Southern Sierras Power Company is complete. Finishing touches are being put on the substation at the site and work is being rushed on the 32-mile line from Victorville to San Bernardino, over the mountains. The entire job will be ready for testing soon after June 1.

Work started from the Victor substation, 5 miles out of Victorville, on January 1. On April 25 the line was tied in at the substation at the dam site. Work was well organized with four camps serving the crews. The line will be operated at 88 kv. during the construction of the dam, and then will be used to feed back from the power house to be built on the site. From the roadway the Southern Sierras company had to build 1¾ miles of road through solid rock to reach the substation site. At the substation voltage will be stepped down to 2,200 for operations at the dam and to 3,300 for distribution to the town, 7 miles away.

At the San Bernardino plant a second 15,000-kw. condenser with transformer

▼ ▼ ▼

FRANKLIN MEDAL GOES TO W. R. WHITNEY



Among those who received the coveted Franklin medal from the Franklin Institute at Philadelphia last week were Dr. Willis R. Whitney, director General Electric research laboratories (left), and Sir James H. Jeans, the English scientist (center). Secretary Howard McClenahan of the Institute is on the right.

equipment is being installed to take care of the new load. Service for Hoover Dam will come off the main buses of the company's system at San Bernardino

▼

Power and Regulation in State Legislatures

ALABAMA.—A bill has been introduced to prevent utility companies from operating in the retail merchandise field. The bill is patterned after the act passed in Oklahoma. Alabama is the thirteenth state to consider an anti-utility-merchandising law this year, though Oklahoma and Kansas are so far the only states where one has passed.

ILLINOIS.—Three bills that would have permitted two or more cities to join in establishing public utility districts for the purpose of operating utilities have been killed in the Senate committee on corporations and municipalities by nineteen to six. The House bill giving city commissioners authority to invest earnings of municipally owned utilities was sent to its passage stage after being amended. Under the original bill the investments could be made by the mayor and two commissioners, but the amendments place the matter in the hands of the entire council. The House bill to abolish the Illinois Commerce Commission was killed by the House committee on public utilities. A House bill provides that cities and villages shall have power to regulate and inspect electrical appliances and, if found so defective as to interfere with radio reception, to require the owner or operator to adjust or repair them. Favorable committee action has been reported on a House bill providing that neither the mayor nor commissioners of cities under the commission form of government shall be officials of any public service corporation.

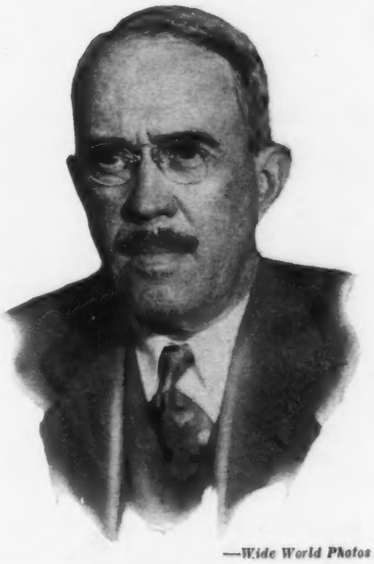
NEW MEXICO.—A new enactment provides that the voters must approve contracts for construction of water, gas or electric works at a general or special election, provided the work has not been authorized by county commissioners previous to the incorporating of a town. Anohter act makes it possible for municipalities to grant franchises for public utilities if 10 per cent of the voting population petition for them and the franchise is approved at the polls. If a special election is necessary, the expense is to be borne by the applicant for the franchise.

PENNSYLVANIA. — Reiterating the findings and recommendations of its preliminary report, the House committee which has investigated the Public Service Commission and the utilities made its final report Monday night, two of its members submitting a minority finding. The majority report declared that the commission has lost the confidence of the people, that the utility companies have enjoyed excessive incomes, that the Governor should have the power of removal, that valuations should represent prudent investment, and that the amended Howell bill (described last week, page 936) should be enacted. (See page 978.) The Senate has confirmed by a vote of forty-six to two the nomination of Samuel H. Walker as a member of the Public Service Commission for another ten-year term. Mr. Walker's nomination was sent to the Senate by Governor Fisher just before he turned over the reins of government to Mr. Pinchot.

TEXAS.—The Legislature adjourned at the end of last week, but Governor Sterling announced that he would probably call another special session in a few weeks to deal with unfinished business. Representative Petsch said that he would reintroduce at that session his bill for a state utilities commission.

WISCONSIN.—The Duncan bill increasing the Railroad Commission's regulatory powers over public utilities (ELECTRICAL WORLD, May 9, page 838) has passed the Senate by 20 to 1. The name of the commission is changed to Public Service Commission. The bill must be approved by the Assembly and signed by the Governor before becoming a law, but this is virtually assured. A bill introduced in the Assembly May 20 prohibits utility companies from selling merchandise. Companies selling such goods or discontinuing service for failure to pay for them would be subject to a fine of $50 to $200 for the first offense and revocation of their charter for the second offense.

MORRIS LLEWELLYN COOKE CROSSES THE DELAWARE



—Wide World Photos

Mr. Cooke, Philadelphia "consulting engineer in management," who directed Governor Pinchot's "Giant Power Survey" in 1923 and is reputed to have been his right-hand man in power matters ever since, has now been sworn in as a member of Governor Roosevelt's New York Power Authority.

▼

Forming of North American Subsidiaries Described

CONTINUED INQUIRY into the North American Company as part of the Federal Trade Commission's investigation of utilities brought further testimony on May 20, 21 and 22 from A. E. Lundvall, one of the commission's accountant-examiners. He described the acquisition of various subsidiaries and told how the North American Company conveyed directly to the Union Electric Light & Power at cost public utilities which it acquired and which fitted in with the Union company's system in the St. Louis district and adjoining territory.

At another point in his testimony Mr. Lundvall told how the North American Company had let the contract to build the Cahokia generating station opposite St. Louis to McClellan & Junkersfeld, had transferred the station to the newly organized Union Electric Light & Power Company, had afterward (in 1924) acquired the McClellan & Junkersfeld concern for $50,500, but, finding the acquisition, though at first profitable, afterward less so, because its subsidiaries often employed other engineers and builders, had transferred that organization to a subsidiary, the Edison Securities Corporation, which in 1928 had disposed of it to the Stone & Webster Engineering Corporation, together with $250,000 in cash, for 10,000 shares of the Stone & Webster company, or 10 per cent of its capital stock.

Mr. Lundvall in the course of his long testimony also referred to the cancellation of $1,308,582 floating debt and the donation of 15,000 shares of common stock of the North American Edison Company back to that company by the North American. This action, he said, was taken to enable North American Edison to write down its investment in the Milwaukee Electric Railway & Light by $2,183,911 and in the Union Electric Light & Power by $174,670. "It appears," said Mr. Lundvall, "that the write-down in value of the stock was primarily to reflect conservatively a value for the stock which would be under rather than over its equity or book value."

On May 22 Mr. Lundvall read into

the record tables relating to the income and surplus of the North American Company over the period 1904 to 1929. He said that dividends received from subsidiaries and companies in which it has minority interests were the principal source of earnings of the North American Company. He amplified testimony by other witnesses to the effect that the North American Company does not charge fees for management or supervisory services to its subsidiaries. The company has been paying dividends since 1923 on its common stock at the rate of 2½ per cent per quarter in common stock. The policy of paying in common stock has not resulted in any impairment of asset value or dilution of stockholders' equity.

"Write-ups" and "write-downs" and a profitable return on investment were shown when this week's hearings began on May 26. The North American Edison Company security holdings in operating companies were appreciated $3,510,000. This was amortized and a depreciation of $2,358,582 in security values made. During the years 1922-29 gross earnings were $49,455,022 and expenses $12,290,709, leaving a net income of $37,164,313. Additional net credits amounted to $13,127,549, making a total of $50,291,862, of which $43,549,280 was distributed as dividends to the North American Company. Steady growth of income has been enjoyed by the North American Edison Company since its organization in 1922, when net income amounted to $1,129,961. In 1929 net was $8,915,522. Its operating companies in 1929 averaged a return of 15.5 per cent on the North American Edison's investment in these properties.

▼

Supreme Court Sustains Ohio in Gas-Tax Case

DECISION BY THE United States Supreme Court in East Ohio Gas Company vs. Tax Commission of Ohio (ELECTRICAL WORLD, May 2, page 798), handed down last week, has a possible bearing on the electric light and power business inasmuch as it sustains the tax levied by that state on the entire gross receipts of natural-gas companies, including sums accruing from the sale of imported gas as well as the income from gas produced within the state. Prior to 1930 the tax had been levied on intrastate-gas receipts only, sales of imported gas being regarded as protected from levy by the constitutional provision forbidding taxation of interstate commerce supplemented by a clause in the Ohio law itself which expressly excluded receipts "derived wholly from interstate business," but in the year named the Tax Commission claimed the right to include all the company's business. The question, therefore, was, in the words of the decision, "whether the state statute, construed to include the amounts reported as receipts from interstate business, operates directly to regulate or burden interstate commerce."

In finding for the state the Supreme Court premises emphatically that transportation of gas across state boundaries is interstate commerce within a well as without the state, but says that a tax levied on gross receipts after the imported gas has been segregated into "many thousand relatively tiny streams" does not contravene the law, the final disposition of the commodity being "a business of purely local concern exclusively within the jurisdiction of the state."

VIRGINIA ELECTRIC HAS NEW NORFOLK OFFICES

Jet-black terra-cotta base and colored relief panels are features of this building, which 34 floodlamps and four beacon lights make brilliant at night.

▼

Cost of Upstate-Metropolitan Lines $7,200,000

APPROVAL OF EXPENDITURES of $7,200,000 to interconnect electric power lines between upstate New York and Westchester County was asked of the Public Service Commission at Albany on May 25 by the New York Power & Light Corporation. I. D. Whittemore, executive engineer of the corporation, testified that the interconnection, which will extend to the New York Edison lines, will prove largely beneficial to the Hudson Valley and upstate New York territory and bring "substantial economies" in the operation of all the companies affected, with an eventual tendency toward rate reductions.

Mr. Whittemore described the proposed interconnection in detail, asserting that the substation to be constructed at Pleasant Valley, near Poughkeepsie, will be the junction point for one of the largest power pools in the world, while energy will also flow into the Hudson Valley system over lines extending from Conowingo through Pennsylvania and New Jersey and lines connecting with the New England Power Corporation at the Connecticut state line. Power coming into the Pleasant Valley station from the Mohawk & Hudson territory at 110 kv. will be increased to 220 kv. for delivery in New York City, he said. Of the total cost of the project, $550,000 represents the estimated price of right-of-way from Rotterdam and East Greenbush to the Westchester County line. It is expected that an application for completing the transmission lines through Westchester County to Yonkers will be made by the New York Edison Company.

▼

Middle West Division Urged to Defense

APPARENT IN THE WORDS of some and in the tone of many of the papers and addresses before the convention of the Middle West Division, N.E.L.A., at Excelsior Springs, Mo., last week was the awakening disposition of the electric utilities to fight back at their detractors. Connected with this, as was brought out in the presidential address of C. A. Leland, Des Moines Electric Light Company, was seen to be need for greater cohesion in the industry through participation in the work of the national association and for closer cooperation with dealers and contractors. These thoughts were echoed by T. O. Kennedy, chairman Commercial National Section, who joined to them a plea for consideration of rate revisions based on sound commercial judgment.

That the fair and common-sense principles of merchandising embodied in the plan to sell a million electric refrigerators this year would have prevented the passage of state anti-merchandising legislation if they had been included in appliance-selling activities of utilities in the past was asserted in a paper on the national refrigeration campaign by J. E. Davidson, read in the author's absence by L. O. Ripley, Kansas Gas & Electric Company. A prescription handed back to the doctor with the advice that he take it himself appeared in the remarks of Harry Reid, chair-

man Public Relations National Section, as he spoke of newspapers that championed the cause of governmental ownership and operation of electric utilities. An attack on the self-satisfied attitude of many utilities that smugly assure themselves that their public relations are perfect and refuse to do any work in that direction was made by A. E. Bettis, Kansas City Power & Light Company. That the electric utilities have held up remarkably well in this depressed business period was brought out by comparative figures covering this and the past year convincingly presented by Paul S. Clapp. The crying need for promotional effort to extend service to the farms of the country and build up rural loads was forcibly set forth by N. G. Symonds, Westinghouse commercial vice-president.

A feature of the convention was the regional public speaking contest which included the Southwestern, Middle West, North Central and Great Lakes divisions. New officers are: President, W. W. Austin, Inter-County Electric Company, Cottonwood Falls, Kan.; vice-presidents, J. E. Harsh of Joplin, Roy Page of Omaha, and George A. Neal of Sioux City.

▼

Adjustment of Rates Sought in South Indiana

ADJUSTMENT OF RATES for electricity and gas in 22 counties in southern Indiana served by the Public Service Company of Indiana (formerly the Interstate Public Service Company) has been asked by the company in a petition to the Public Service Commission. The action was taken because of a rate case instituted by the city of Bloomington and now pending before the commission. Instead of confining the hearing to Bloomington alone, the company proposes an investigation in all of the territory known as the "south system."

The company is thought to have in mind the revival of the "common power source" theory of rate making, advocated on previous occasions, but rejected by the commission.

This territory includes 67 cities and towns supplied with electric light and power as well as service to a large rural territory and to many industries outside of municipalities. Rates in this territory are not uniform, because it was originally served by many small isolated systems under different managements, the petition states. Since these properties have been acquired by the present company many voluntary rate reductions have been made, but many rates are still in effect which are unreasonable and not uniform.

Scattered Happenings in the Electrical Sphere

UNITED STATES

Atlanta Council Attacks Commission

Charging that the Georgia Public Service Commission "has failed to protect the interest of the people who elected it," the Atlanta City Council, by a vote of 20 to 12, has passed a resolution—which, however, has been vetoed by the Mayor—demanding that the regulation of public utilities in cities of 25,000 population and over in Georgia be taken from the commission and vested in the local governments. It has also provided for a committee of five members to investigate the possibilities of municipal ownership of public utilities in Atlanta. Gas rates seem largely responsible for the agitation. The Municipal Utilities Rate Association of the state, however, has antagonized the Georgia Power Company and demands representation of the people by experts at commission hearings.

Beebe Island Plant Contracted For

Frederick T. Ley & Company of Springfield, Mass., have obtained the contract for the Beebe Island power plant at Watertown, N. Y. The development will be approximately 10,000 hp. in two units. The power house will be on the north side of the channel. The Niagara-Hudson Power Corporation will take all surplus power.

Second Unit of Wyman Plant in Service

The second unit of the hydro-electric generating station of the Central Maine Power Company at Bingham, Me., is now in service. The first unit, which was temporarily placed in service last January, has started its official run, and it is estimated that the two units can turn out 200,000,000 kw.-hr. yearly.

St. Paul Asks Rate Reduction

A request that the Northern States Power Company voluntarily reduce its rates on electricity has been made to officials of the company by the St. Paul City Council. The request is based on a report by Edward Bemis, valuation expert, that the company is earning between 9 and 9½ per cent on its electric properties.

Third Annual Illumination Conference

Among the topics at this conference, to be held at the Westinghouse Lighting Institute, Grand Central Palace, New York, on June 15-17, are gaseous tubes, wiring specifications, design of modern lamps, recent new equipment, the coming world's fair at Chicago, simplifying floodlighting sales and a direct approach to the home-lighting market.

Applications Dwindle Under Oregon Law

Making the minimum charge for a hydro-electric permit $50, instead of $5, in Oregon is held mainly responsible for the fact that few petitions have been received by the new Hydro-Electric Commission so far. The increase in the fee was part of this year's water conservation act.

Kansas City, Kan., Has Unit Underway

An extension to the municipal generating plant of Kansas City, Kan., to cost $1,500,000, is being built, the steel framework having just been finished. Kansas City, Kan., has steadfastly refused to sell the plant, now rated at 35,250 kva.

Taxation of Osage River Plant

Attorney-General S. Shartel of Missouri holds that the lands inundated by the Union Electric Light & Power Company's hydro-electric development at Bagnell are subject to taxation by the counties in which they are situated. The tax question was submitted to Mr. Shartel after the recent Assembly failed to pass a bill providing specifically for the taxation of hydro projects.

Illinois Northern Utilities Cuts Rates

Reductions in residential and commercial lighting, small power and other rates filed by the Illinois Northern Utilities Company (Insull-controlled) with the Commerce Commission, to be effective June 4, will affect 104 towns, including Dixon, Freeport, Belvidere, DeKalb and Sterling. For residential lighting the first block has been changed from 3 kw.-hr. to 4 kw.-hr. per room per month and the rate cut from 10 to 9 cents. There are no changes in the second block, but the excess is reduced from 6 to 5 cents.

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Coming Meetings

Association of Electrical Maintenance Engineers—Mayflower Hotel, Akron, Ohio, June 4 and 5. S. C. Hansen, 640 N. Main St., Akron.

National Electric Light Association—Atlantic City, June 8-12. A. J. Marshall, 420 Lexington Ave., New York.

Public Utilities Advertising Association—New York, June 14-16. Room 1748, 4 Irving Place, New York.

Association of Iron and Steel Electrical Engineers—Cleveland, June 15-19, J. F. Kelly, Empire Bldg., Pittsburgh.

Illumination Conference—New York, June 15-17. Westinghouse Lighting Institute, 46th St. and Lexington Avenue.

Canadian Electrical Association—Banff Springs Hotel, Banff, Alberta, June 16-18. H. W. Lyster, 407 Power Bldg., Montreal.

American Institute of Electrical Engineers—Summer convention, Asheville, N. C., June 22-26; Pacific Coast Division, Lake Tahoe, Calif., Aug. 25-28. F. L. Hutchinson, 33 W. 39th St., New York.

Pacific Coast Section, N.E.L.A.—Del Monte, Calif., June 24-27. K. I. Dazey, 447 Sutter St., San Francisco.

Camp Co-operation XI—Association Island, Henderson Harbor, N. Y. July 27-31. Society for Electrical Development, 420 Lexington Avenue, New York.

Atlantic City—N. E. L. A.—June 8-12

There are some man-sized problems before the electric light and power industry.

—Planning for further economies in system operation and construction.
—Developing the half-saturated market for electrical services.
—Finding a way out of political-utility discord through real public relations.

To Atlantic City and the annual N.E.L.A. convention go delegates—from there should emerge plans, courage and enlightenment. An industry awaits.

EDITORIAL

L. W. W. MORROW
Editor

At the Fifty-fourth Milepost

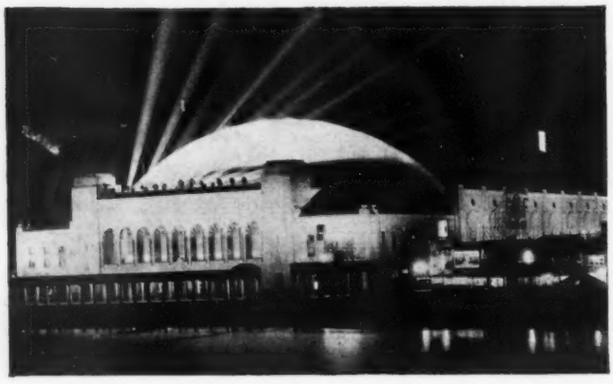
ALTHOUGH but lightly touched by the withering hand of depression and more concerned with the familiar problem of how to expand its engineering, commercial and public relationships than with any pressing necessity of learning how to subsist on starvation rations, the electric light and power industry is at an exceedingly important crossroads. The annual convention of the National Electric Light Association, which opens a week from Monday, brings serious questions for attention, deliberation and decision.

How may the growing tumult—some of it in good faith and some of it in faith surprisingly bad — against the loosely designated "power trust" be allayed? How may economies to reduce costs, and in turn rates, still further be effected when present economies stand as the virtual summation of engineering efficiencies in an age of super-intensity toward the economic use of labor and materials? How may the increments of untouched energy markets, increasingly difficult to reach, be shifted to useful and profitable customership and out of the classification of "potential"? How may the undercurrent of bad feeling that has arisen from mistaken acceptances in utility-dealer relationships be directed into amicable channels? How shall future financing be arranged and carried out in the face of declining property values and stock-market quotations which still continue to fall?

Certainly to these questions, and probably to many others, answers are due at this significant time. If no solutions are forthcoming today, at least a program which will point the way toward constructive work later is to be looked for confidently. With courage, aggressiveness, faith in the future of American business and hard work electrical men have built their great industry. No group has done more to insure the rapid return

of satisfactory business conditions. No industry has done more to insure its own economic stability in this time of stress. It is not a demoralized, dispirited or discouraged gathering that will meet in Atlantic City, but one of hopeful men, eager to carry on in the same spirit that has commanded success before and when properly applied will ever do so again. No doubt a certain familiar note of gayety at the convention will yield to one of more serious purpose, for there is a tremendous task to be accomplished.

NEWEST among engineering developments is the standardization idea. In almost every branch of the industry it is discussed. Relatively little has been accomplished, but the outcome is virtually certain. Standardization in its new, broad sense, so far as the electrical industry is concerned, means both the elimination of uneconomic individualism and the advent of line production in the plant of the manufacturer of electrical equipment and standard factory-built installations among users of this equipment. Goodby to prima-donna temperamentalism in having each installation and each design like nothing else on earth! Farewell to costly fabrication of a thousand different units in manufacture when fifty will serve! There is talk of boiler-condenser-turbine-auxiliary units for this or that kilowatt rating to be sold as such, of underground-network elements which, complete, can be dropped in a manhole and put to work. No longer will the engineer, in simile, specify parts and build his own car (or substation), but rather he will, still in simile, buy the car complete (the substation as type A or B, 1,500 kw.), and the job will be done. Manufacturing will be simplified as factory assembly eliminates much costly field work. Mass production then takes the place of custom-built installations. Prices drop. Further economies are possible for the user, with better profit margins for the manufacturer. Acceptance of the idea depends upon the broad-minded and far-sighted viewpoint adopted by utility men. At Atlantic City informal discussion will point the way.



Will there develop at Atlantic City an acceptance by industry leaders of the need of a new commercial idea? Will the positive results obtained in the all-electric-home, one-sale plans of Poughkeepsie, Vancouver and other cities lead to a broader concept of electrical utility markets and permit the remainder of America's half-saturated electrical energy market to be brought into the fold? Sniping sporadically is a long-drawn-out process, and the acceptance at this time of a real merchandising idea in a true merchandising manner would mean a vast acceleration in the use of energy. The industry sooner or later will have to make it vastly easier than it now is for the potential or present customer to have all he wants or can use of outlets, lights, light-duty and heavy-duty appliances and must enable him to secure these services in a far easier way. Here lie the hopes of future profits and dividends. The home market must be developed. Atlantic City may offer the approach to industry action for the accomplishment of this task.

How is financing to be undertaken and carried out in these difficult times? The costs of metals, materials, labor and equipment have fallen. Recent estimates indicate a shrinkage of prop-

erty values of 30 per cent upon the basis of replacement costs under present conditions. Market prices of utility stocks have declined 60 per cent from those of roaring boom days. What will be the investor's attitude? How may it be favorably developed? Must all reliance be placed in financing through senior securities? And just what is to be done about depreciated property values? Will the stock market assume the sole burden of readjustment or will accounting procedures be fostered to "write down" that which has so often been "written up"? True, the bankers will have their say on that, but what is the program? Financing must go on. Flotation costs and fixed charges must, however, be kept low if rates are to be maintained at present levels or further reduced from time to time and if dividends are to be unimpaired. This is one of the greatest of the problems facing the industry, and it is related closely indeed to the greatest and most controversial of all—the problem poorly named "public relations." Will Atlantic City point the way?

OUT of the chaos, misrepresentation and, be it said, mutual bad feeling which characterize the interrelationships of politicians, independent thinkers and utility men may be brought a semblance of "sweet reasonableness" and a full measure of workable co-operation. No situation is so bad that amelioration is not possible, and, in all fairness, the present outlook is not so black as it may appear. With two or more opposing viewpoints expressed on every major controversial issue, it is seldom that either side can be entirely in the right. Merely to shout longer and louder than the opposition is certainly no way out. Nor yet is virtuous isolation in state of siege to be viewed as ultimately leading to much more than a loose belt line, with eventual capitulation sure. In any event such tactics solve few problems, certainly none in so intimate a difficulty as utility public relations.

Assuming that there is merit in at least some of the contentions on either side, the solution may

lie in frank but calm debate. Open-minded discussions and decisions by the industry as a group and by individual leaders for their own properties can keep the way clear for continued public acceptance of private enterprise and bar progress toward government ownership. Open-mindedness must surely mean to stand fast by the right and to yield when wrong—that is, unswervingly to follow the rights and reject the wrongs as they may be defined. Defined by what? By the only possible authority for right or wrong—the currently accepted code of moralities of the major portion of the people. Not defense, not publicity, not better service alone or separately, offers the likely avenue of ultimate approach to the dissipation of the misunderstanding of the utilities. Education and resourcefulness, honesty and frankness can, and let it be hoped will, win the day. Is the N.E.L.A. meeting in Atlantic City to inject a new note into utility policies on this subject too?

Thus the Atlantic City meeting is a call to the industry to measure up to new conditions and new possibilities. That it will do so there can be no doubt. There is too much well-grounded enthusiasm to permit loss of faith in the initiative and wisdom of the leadership that has placed the industry on the present height of accomplishment.

No Industry More Stable or

W. Alton Jones
President National Electric Light Association

A CURIOUS paradox in connection with the economic history of the United States for the past fifteen months is that the consumption of domestic electricity, which, like the consumption of other commodities, has always been considered an index of the times and the general condition of Mr. Average Citizen's pocketbook, not only increased in total volume but by 10 per cent per average customer. At the same time the market for wholesale electricity held its own and failed to reflect, to any great extent, a marked cessation in business and industrial activities. More than half a million new customers applied for service, while the electric utilities raised and spent more than $850,000,000 of new capital in extensions, improvements and new construction, demonstrating that in spite of stock markets and a general air of pessimism they still enjoyed the full confidence of the investing public. In fact, the history of this particular cycle of business depression and widespread unemployment seems to have swept over the light and power industry and left it without any marks whatsoever which might indicate its passing.

Contemplating the future is always more interesting than contemplation of the past, but our accountants, statisticians and economists tell us that we can only judge the future by careful analysis and interpretation of the records of past performances of an industry and its normal market. The steady growth and expansion of the electrical industry, accompanied by an almost unbroken record of reduction of rates from year to year and constant improvement in the quality of the service rendered to the people of the nation, augurs well for its future and establishes, for all time, the soundness of its policy of careful planning for years to come. Like the telephone and transportation industries, it knows that it must always keep about two jumps ahead of the demand for service and that it must know, and be prepared to meet, that demand, not for next week or next month or even next year, but for years to come. It must know just what its requirements for new capital will be from year to year and must be absolutely certain of sufficient additional business to pay the wages of this new capital in the face of its obligation to keep faith with its consumers by carrying out its announced policy of rate reductions, limited only by sound business principles and sound financial structure.

As for the year 1931, it already promises to be a repetition of past years. Long-time planning has called for the expenditure of between $700,000,000 and $750,000,000 of new capital this year and it is being spent in accordance with that plan. The market for wholesale power shows only slight fluctuations from week to week, while the demand for domestic energy marches steadily forward, as it has in years past—another paradox, by the way, for while the consumption of domestic electricity by the average consumer is steadily increasing, his annual bill remains almost stationary, due to decreased rates made possible by that very increase in consumption. The industry continues to enjoy a steady flow of ready and cheap money for new construction and extensions of existing plants and lines in spite of continued whining about the depression and unemployment.

There has been much talk about the market for domestic current and the alleged "approach of its saturation point." The common argument is that with 29,000,000 homes in the United States, of which more than 20,000,000 are wired, while 6,000,000 of the balance are on farms, the gateway for a steady increase in the production and distribution of this great and important commodity is gradually closing. The facts are that the industry has barely scratched the surface in so far as the use of electricity in the home is concerned. Not this generation, nor the next, nor the one which will follow that one will live to see the saturation of the market for domestic light and power. A wired home in this country does not mean an electrified home any more than an arc light before the front gate of a factory means an electrified industry or the single incandescent lamp or two in a Japanese house means an electrified Japanese domicile.

Take the case of electric refrigerators alone, which, from the standpoint of central generating stations, are splendid load builders. At the close of last year it was estimated that there were less than 2,000,000 in use in the United States and the industry organized a campaign to sell 1,000,000 of them in 1931. Reports from the new refrigeration bureau of the National Electric

or with Brighter Future,

says N.E.L.A. President

Light Association, which sponsored this campaign, show that sales directly traceable to it are far ahead of the expectations of its managers. At the present rate the close of 1931 will show 3,500,000 homes equipped with electric refrigeration and enjoying its contribution to health, comfort and household economy.

In the same way, cooking by electricity—another splendid load builder—and hot water heating provide an almost unlimited market for domestic electricity. At the present time there are less than 1,000,000 electric ranges and a negligible number of electric hot water heaters in use, in spite of the fact that electricity is the most convenient and comfortable form of heat for these processes. The cost of the necessary equipment is decreasing, while the mass production of electricity for domestic purposes is rapidly increasing, and we can look forward confidently to the time when electricity will do all the work in connection with the preparation, cooking and preservation of food in almost every home.

One could go on describing a long list of uses for domestic electricity which are as yet in their infancy. The point is that while the domestic consumer of today is using on an average 550 kw.-hr. a year for lighting and electrically operated devices, the average consumer of tomorrow or the day after will be using 1,500, 2,000 and even 3,000 to 5,000 kw.-hr. a year and at a rate which will affect favorably his total cost of living.

The light and power industry has by no means climbed the mountain and approached the topmost pinnacle of its career—it has just managed to get away to a running start. Only when every wired home has been completely electrified, when every one of the 5,500,000 farms as yet without service are hooked on to some central generating station's transmission lines, when every manufacturing establishment is receiving its power over slender copper wires because it is cheaper than generating its own power, then, and then only, will the industry's job be completed, and then, and then only, can its builders and managers sit back and say that they have reached the saturation point and can no longer provide an opportunity for the investment of new capital.

Personally, I believe that by 1940 the total number of our domestic customers will have increased by no less than 4,000,000 and that the average yearly consumption of what will then be 24,000,000 consumers will be at least 1,250 kw.-hr. This means an increase of 19,000,000,000 kw.-hr. a year over the 1930 figures, or 173 per cent. I look for the demand for commercial light and small power to double by 1940 and believe that the demand for wholesale power will increase by 50 per cent. It is doubtful if there will be much change in the present yearly consumption for street railway power, which now amounts to about 5,000,000,000 kw.-hr., although the demand for electrified railway power should quadruple the present figure of 1,000,000,000 kw.-hr. Street lighting, highway lighting and miscellaneous sales will probably triple the present figures. These prognostications are based of course, on the assumption that the consumer's purchasing power in 1940 will be the same as those of 1929, and this is a fairly safe assumption.

There are other and equally important implications in connection with the potential market for electric service and these are the matters of employment and unemployment. Any increase in the demand for it is necessarily preceded by a demand for electric appliances and machinery to be operated by that service and this means the employment of more people by the manufacturers of appliances and machinery.

We hear much these days about mass production and the use of electric power creating unemployment because one man can do the work which formerly required two, three, four or six in the old days. It is quite true that in the days of ancient Egypt, Greece and Rome industry and commerce, as well as the routine activities of everyday life, depended largely upon man power—most of it was slave power. Each Athenian of the Golden Age of Pericles was said to be entitled to five slaves. Today the average American worker commands from electricity the equivalent of many times that number of slaves, and man-muscle-power is decreasing steadily in importance.

But—and again we find ourselves face to face with what looks like a paradox—while electricity and mass production seem to add to the problem of unemployment of individuals, they really provide the solution by creating new jobs, adding to the demand for men and women to fill them, and greatly increasing the purchasing power of the nation as a whole, thus contributing to the stabilization of employment.

There is no industry in the country which is more stable than the industry which furnishes electric light and power and there is no industry which can look forward to its future with greater equanimity. It has always been so and will always be so. It has weathered every financial storm and business depression since that day in 1882 when Edison opened the first central generating station with scarcely a perceptible rocking of the boat, and there is no reason to believe that the future will have any other story to tell. Political unrest has affected it but little. Regulation, under state utility laws administered by state public utility commissions, has been worked out to the satisfaction of utility executives, owners of utility securities and consumers of utility products. It will take more than the socialistic movement for some sort of government-owned-and-operated Utopia to change the existing order of things in so far as it is concerned.

Managing Director Clapp Sees

A Time for Constructive

Paul S. Clapp
Managing Director
National Electric Light Association

THE National Electric Light Association is on the eve of holding its fifty-fourth convention. The electric light and power industry is about to enter into the last year of its first half century of service to the American people. The electrical development of the nation, the growth of the electrical industry and the work of the National Electric Light Association are interwoven in one great record of progress.

There are two aspects of the electric light and power industry which at the present moment are of most vital interest. These relate to the business performance of the industry and the general public relations situation. I wish to discuss these briefly:

General business conditions are of such immediate and vital concern to every one these days that it is of interest to make observations on how the electric utility companies, as a whole, are weathering the present depression.

The total kilowatt-hour sales of electricity to all classes of customers for the first four months of the year were 4.8 per cent below the corresponding period for 1930. Sales to domestic customers and to small light and power customers show good increases. Use of electricity by householders for the nation as a whole is 8.5 per cent above last year and 24.5 per cent above the first four months of 1929. This increase in domestic business is of vital significance.

Purchased electric power is now used to drive two out of each three horsepower utilized by factories, mines and in other general industrial operations. Electric power becomes one measuring stick of the nation's industrial performance. Electricity used in these operations for the first four months shows a decrease of 13 per cent under last year. There is some encouragement in this sector of our business, however, for industrial power sales have shown some improvement, month by month, since the beginning of the year. It is important to note that industrial electric power has not fallen as much as the general levels of manufacturing production. The full reason for this has not been determined, but it indicates a preference for purchased electric power as against that locally generated.

The falling off in use of power for industrial purposes has been offset to a considerable degree by the steady increases in domestic consumption. This is reflected in aggregate gross revenues of electric utility companies, which for the first four months of the year are but 1.5 per cent below 1930.

Concurrent with the increased home use, average prices of electricity to homes continue downward, a reduction of 4.6 per cent in average rates having been made during the past twelve months. For the first time in the history of the industry the average household rate has gone below 6 cents. This decrease has been accomplished largely through increased use by existing customers, since the number of new customers added since the beginning of the year shows but slight gain.

In view of the general business situation, and as compared with many other industries of the country, this economic performance of the electric light and power utilities is excellent. It proves the high degree of stability of the business.

On the other hand, this favorable performance is one of the reasons why electric power utilities are a target for criticism and attack. I expect this relatively favorable business performance to increase and accentuate our political and legislative difficulties.

The large increase in domestic load which has been such an important stabilizing factor, and which accounts largely for the favorable economic performance, has not just happened. This business was not handed out on a silver platter. It is not always recognized that the good showing in business is largely due to the sound management, careful planning, hard work and aggressive salesmanship of the entire electric industry.

The experience of the months since the business depression started proves conclusively that electric refrigerators and other appliances can be sold, and that now, more than ever, the energies and efforts of the industry

must be vigorously and intelligently exerted to increase domestic utilization of electricity.

In my opinion, now is the time to increase advertising appropriations, to tune up commercial organizations, to align ourselves with the dealers and other merchandisers in local communities, and to get out after business. Although every one is carefully scrutinizing expenditures and hard at work to effect economies, care should be taken not to curtail expenses in the wrong direction.

The electric utility industry and the electric light and power companies admittedly are under criticism and

Aggression

attack. It is of extreme interest to make brief analysis of some of the sources of these and to determine, if possible, the actuating causes and the motives behind them. Such an analysis leads to the conclusion that these attacks have essentially two main origins—(a) political and (b) government ownership advocates.

(a) Political.—The activating motive for some politicians to take a position of attack against public utilities arises from ambition for political advancement. The "presidential bee," "senatorial bee," "governorship bee," or some other political bee, is often the underlying cause. This is perhaps only human and natural. Nevertheless, under the guise of being protectors of the great rank and file of the common people, and perhaps with the confident and sincere belief that they actually are, some politicians are engaging in utility baiting. They initiate investigations, they give out publicity, they make speeches. They think this will win them popularity and votes. Their real motive is often a desire for political recognition and promotion. This is nothing new in the realm of politics, and various industries, one after another, have been subjected to this treatment. But it is always particularly unpleasant when it is focused toward the business in which you happen to be engaged. Political capitalization of any business is always to be regretted. At this time, when all business men are straining to keep workers on their jobs, the assistance and not the criticism of politicians should be expected.

(b) Government Ownership Advocates.—A small group in the United States are vigorous and ardent crusaders for government, or political, operation of electric power. They, too, are capitalizing the present situation. They are more vigorously than ever urging for municipal operation, county or district operation, state operation, and operation by the federal government. Their organizations are at work in every state and in the national capital. For the present, they will consider as gain any degree of public operation they can get. Their ultimate goal is complete operation of electric power by public agencies, perhaps by some combination of federal, state, district, county and municipal governments, or perhaps operation entirely by the federal government.

These individuals and their followers would not stop with government operation of electric power. Just now they believe that electric utilities are the most favorable point of attack in furtherance of their ideas. They favor government operation of all utilities—railroads, telegraph, telephone, gas; of mines, of certain other industries. There is no definite stopping place in their minds. They are out of sympathy with the principles upon which the government of the United States is founded and the concepts upon which we have so far attained the progress made in self-government. They are opposed to private capital, reward for effort through profit, and individual enterprise. It is a clash between individualism, on the one hand, and collectivism, on the other. They would completely reverse those principles which most Americans believe account for our remarkable initiative, for the significant fact that there has been opened opportunity in this country for thousands of poor men to rise to positions of leadership, and which most people believe are largely the reasons for the progress we have made in standards of living and in distribution of wealth enjoyed not alone by a few but by the people generally.

Group Is Small.—The number of these crusaders is small, perhaps not numbering more than fifteen persons as the leaders. They certainly are in a decided minority, yet the energy, persistence, hard work, rigid adherence to their ideas, skill at propaganda, and what almost amounts to religious zeal, of this minority group makes it a force that the people of the country cannot minimize.

Complete changes in government and assumptions of full authority before now have been brought about in some countries by just such groups.

No one wants the government in his own business

The large majority of the people in the United States do not believe that government should be in business; that is, they do not want the government in *their* business. Those in the textile business, shoe business, grocery business, dry goods, paint or automobile business would strenuously oppose any proposal for the government to take them over. Certain it is that the newspapers would not tolerate the idea that the government should operate the newspapers and control the channels of information as they do in some countries. The public generally would agree with them in this contention. Strangely enough, we are usually perfectly content to let the government take an excursion into the other fellow's business. We fail to see that this subtle and gradual extension of the idea may ultimately affect all business and over a period of time may change the very complexion of the government itself. After all, there is great wisdom in the saying that "the price of liberty is eternal vigilance."

Characteristics of the Propaganda.—The propaganda activities of these government ownership advocates about the "power trust," concentration of control of water power, excess profits, overcapitalization, etc., are in large part "smoke screens." They are weapons deliberately used to create suspicion, to intimidate legislative bodies, to incite public opinion against the utilities. This is a shrewd and clever move to further their program.

Real Issue Is Government Operation.—In my opinion the real issue in the present campaign of attack upon the electric utilities is the question of government operation, or, in other words, the relation between government and business. This is primarily and above all a question of policy in government. Is it sounder and in the public's interest, and better for the future development of the United States, to adhere to the present policy of private development under public regulation (and if improve-

ments or modifications of this regulatory policy are needed, to work them out in a sane and sensible manner), or, should we drop all this and launch into further experiments with government operation?

Chain newspapers sources of trouble

Another element of importance in connection with public relations is that arising from the rapid development of chain newspapers in the United States during the past few years. There are a number of these. They direct the editorial policies, supply news and editorial material for a large number of newspapers, each with its own large area of local circulation.

The effect of this has been to transfer editorial direction to a relatively few men. Some of these writers, either individually or in response to the policies of their papers, attack public utilities in general.

I would emphasize the point that this attitude is usually "general." They seldom make specific reference to particular companies. These editorials and news stories, written in New York or Washington, are transmitted throughout the United States and, under the policies of the papers, are run locally, frequently irrespective of whether what is said is at all consonant with the feelings of the local editor or in tune with the performance of the local utility company in its relations with its own customers and its own public.

Since these articles are usually general in character, and do not make reference specifically to the local company, it is extremely difficult for the local management and employees, through the channels of the local publication, to make correcting statements. There is continuously going on, therefore, a bombardment of innuendo unfavorable to the electric utility industry as a whole, which is disturbing and undoubtedly affects local sentiment and attitude toward the local company.

Utilities Must Take the Aggressive.—I believe the time has arrived when the electric utilities individually in their respective territories of operation should take definite, aggressive action against these attacks, misstatements, partial truths, and sometimes palpable lies against them. Continued silence, failure to answer, nonaction in the face of these attacks amount at times almost to neglect of responsibility and lead to the impression that what is said is unanswerable, and that they must be true. We are declared guilty because we are silent.

I believe our position should be one of constructive aggression. We have no reason to be on the defensive. We have every reason to be on the offensive. No one respects a man who takes a licking lying down. Every one respects a strong, square, double-fisted defender of his rights. These attacks should be answered clearly, openly, completely and authoritatively as they arise.

Public Relations Essentially Local.—The creation and continued maintenance of good public relations is essentially a local job. I believe that the attitude of customers, investors and the public generally toward the local public utilities, throughout the country as a whole, is good. This is a credit to the local management and employees. As long as local public relations remain good, there is little to fear from the continuous bombardment.

Human Aspect of Electric Service.—Fundamentally, good public and customer relations depend upon the character of electric service provided by the individual public utility company to its own customers. This term, "character of service," embodies a wide range of responsibilities. It includes adequate and reliable physical service, provided at reasonable rates to encourage larger use. But these alone will not produce good public relations.

We have examples enough of accentuated political and legislative disturbances and unfriendly public attitude where rates are low and physical service of the best.

Something more is needed. Consideration of the customer, courtesy, promptness and, in general, the conduct of the company and its employees in their dealings with the customer are vital to the very existence of the utility company. This personal or human aspect of electric service is becoming increasingly important. The physical aspects have in large measure been accomplished or are being given considered attention. But we still have much room for improvement in customer attitude through broader and more sympathetic public viewpoint on the part of all executives and employees.

This human aspect of our service can be improved by more care in employee selection and by thorough and systematic training of every employee in the obligations of public service, in how to handle his public contacts, and in those fundamentals of the business which will qualify him to interpret correctly, both in his business and social contacts, the electrical industry as a whole and his particular company.

Employee contacts represent the company

As a business increases in size, the constant danger is that it will become less human and much less understood. The distance between the top executive and the customer widens. The executive becomes more and more dependent upon thousands of employees as his representatives to interpret his attitude, his ideas and his policies. The employees in their daily contacts with the customer—in reading the meter, repairing lines, answering telephone calls, soliciting business, and in a thousand other personal contacts—become the real interpreters of the business to the public. In the mind of the customer, these employees become the embodiment of the whole electric utility company.

When the utility companies were small and the general manager did everything from shoveling coal into the boilers to reading the meters, and was known personally to every man and woman in town, the question of customer relations was simple. But electric utility companies have become large. They must be large to render a large and dependable service. Beyond this, electrical development has been so rapid, it has been so sweeping in its proportions, it has been so filled with mysterious technology, that it has outstripped understanding even of those who are in the business. Little wonder that it has outstripped public understanding.

The responsibility, then, devolves upon the industry to provide opportunity to employees for training in public contact and to develop the facts, the records of accomplishments and performance, and the statements of objectives and purposes upon which public opinion may arrive at sound and accurate conclusions.

If every executive and all employees will diligently apply themselves to public relations as related to their own particular areas of operation, the sum total of this, matched together, makes a national picture of sound public relations which is the greatest bulwark of strength to the electric utilities.

N.E.L.A. LEADERS

1930-1931

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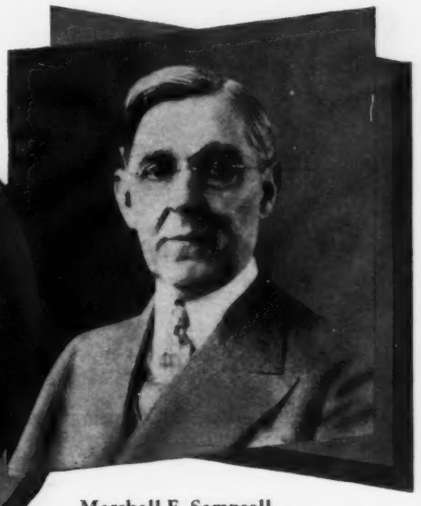
President



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Spares Neither Utilities nor Politicians

By MILTON R. STAHL
Chairman Missouri Public Service Commission

Invited by Missouri Association of Public Utilities to speak frankly, Mr. Stahl declared:

If the industry will face realities it must admit that this agitation could not have succeeded as it has without some plausible foundation. This is a time for introspection—a time for self-questioning.

IT HAS become increasingly evident that both the private operation of our public utilities and the methods and principles of their regulation by the state are becoming the main issues of political struggles. Political campaigns have been and are being waged in the states and in the nation around the operation of public utilities by private capital and the principles, methods and results of public regulation.

In Pennsylvania, New York, Wisconsin and Oregon the leading issue in the last election was public versus private ownership of public utilities and the regulation of privately owned public utilities. In Congress Boulder Dam and Muscle Shoals, the Water Power Commission and federal regulation of interstate electric business were the center of bitter controversy. It is not beyond possibility that a national campaign may be waged on these issues.

In public life there is a type of politician who thrives on ogres and menaces. The nation must always be faced with a grave crisis for which he has a nostrum. He must have his trust menace, his red menace, his predatory aggregations of capital to punch and spar with on the platform and in the legislative hall. Some of the menaces and ogres are a little worn and hackneyed and have ceased to frighten the electorate, hence he has dragged on the stage and exposed to the electorate the hideous monster called the "power trust," and proposes to minister to him some strong medicine to render him gentle and tractable, but which appears very likely to maim the industry. A concerted and conscious effort is now being made to vitalize and dramatize this elusive personality into a national issue.

There is a tendency in conventions of utility associations and in their official publications and publicity to meet these issues with a cry of bolshevik, red, pink, socialist or radical. A good cause cannot be defended by picking an opprobrious epithet for your opponent.

I believe in private initiative. I believe that the majority of those engaged in the public utility business are trying earnestly to render efficient service at a reasonable cost to the public. I know that in a great and wide-flung industry which has been expanding at a tremendous rate the searcher can find abuses, as he can in any industry or business, but this does not mean that the entire industry should submit to a major surgical operation which may cripple it and incidentally result in loss to the investor, and ultimately to the consuming public.

The Missouri commission has seen some of these abuses. I cite as an instance a certain holding company which purchased a number of telephone and electrical properties in this state during the late inflation period. The commission, in considering several of these purchases, warned the company that it was paying excessive prices and that it would not be permitted to base rates on the purchase price. The commission refused to per-

mit the operating companies to issue securities on the basis of the purchase price. The holding company sold its securities on the basis of the prices paid by it for the operating properties. As might be expected, it failed to earn enough to meet its fixed charges and the holding company is now in the hands of the bankers, who are operating it the best they can. Today the telephone properties of that company are in default on payment of toll bills and have been threatened with discontinuance of service. It purchases power at wholesale for one of its electrical properties, and was similarly threatened with bills. Its telephone properties have deteriorated until discontinuance of service for failure to pay its power service has been seriously affected and it is unable to make necessary repairs, extensions and betterments. In the files of the commission can be found instances of excessive fees to holding companies, attempts to issue securities in excess of property values, and other abuses. Within the last year a big holding company went into the hands of receivers with the loss of several million dollars to investors.

In considering these abuses, the important point is that the industry is not being judged by its conscientious and efficient members, but by its minority of sinners. Agitation based on the actions of this minority has resulted in some states in immature and partisan legislation harmful to the industry and to the people.

When the movement for national prohibition started it was not regarded seriously by those affected by it. It was met by calling its advocates cranks and fanatics, instead of correcting abuses from within. The whole business was held up to the public in the light of its worst offenders and was so judged, and the result was a constitutional amendment and legislation abolishing it. If the law-abiding and respectable elements in the traffic had exercised a censorship over the lawless element the nation would have been spared many of its present problems.

Similarly, public utilities can avoid hostile legislation, based on resentment instead of wise consideration of a purely economic problem, if its responsible elements—the great majority—actively expose and oppose illegal and unethical practices on the part of others.

A body such as this will miss its greatest opportunity for service to the industry if it limits its activity to the exchange of information, to the solution of technical problems and to making common cause in matters affecting the common interest. I believe it should pattern its activities after professional organizations, such as medical associations, bar associations and engineering societies, which lay down rules of conduct for their members and discipline those who wander from the straight path.

It is not sufficient that you have satisfied your own conscience in the conduct of your business. Your interest and your welfare are so bound up with the manner in which your brother is discharging his obligations that you are justified in constituting yourself your brother's keeper. Each of you occupies but one room in the house, and when the people or legislature consider the house and pass judgment they will be guided largely by the rooms which are not in order. The press and the publicist will find them and hold them up as typical of the industry.

Your public relations are affected by those of other utilities, and in your own interest you should see that any fundamental causes for bad public relations of other utilities are removed.

Another means of presenting your case is to take the mystery out of the business. A general impression has been created in the minds of the public that there is something sinister about the holding company and something to conceal about its relations with the operating company.

I believe that the holding company performs a valuable economic service and has a definite place in the modern business structure. It would be idle not to admit that there have been many abuses, and that in many cases the economies resulting from integration and consolidation have been absorbed by unreasonable fees and profits to holding companies and associated companies, instead of being handed down to the consumer. In a majority of cases the operating company and the consumer have benefited from the relationship.

The utilities should give the widest publicity to the transactions between themselves and affiliated interests.

Let all these intercorporate dealings be open to the world so as to dispel any feeling that operating costs are being unjustly swelled to the detriment of consumers. If you live in a glass house, open to the gaze and inspection of the multitude, there is less chance that the press, the publicist and the people will throw stones.

In rate cases utilities should voluntarily make the frankest disclosures of their transactions with related companies. A recent decision of the Supreme Court of the United States has strengthened the hands of regulatory bodies in passing upon the reasonableness of fees for service rendered and the fairness of prices charged for supplies by affiliated companies, and the commission expects utilities in rate cases to assume and discharge the burden of proving these items. They will be allowed as operating expenses only when strict proof is made.

The commission should value all public utility properties in the state as rapidly as possible, so that we may act promptly for the relief of either the utility or the public when application is made in any matter in which the value of the property used and useful in the public service is at issue. When the task is completed the commission, by accounting control, can give quick relief in cases involving mergers, consolidations, security issues, acquisitions of stock, and rates. In this way we expect to eliminate the complaint, sometimes well founded, that regulation is slow and cumbersome.

The charge has been made that commission regulation has fallen down. With the great expansion of the public utility business, regulation has in recent years been faced with difficult problems unknown and inconceivable in the period in which regulation by administrative bodies was set up. It is grappling with those problems now and I believe that it will successfully demonstrate its ability to deal with them.

Public utility services in the United States are more widely available, more efficient and as cheap as in any country in the world. It is easy to confuse cause and effect, but I do not believe that I fall into that fallacy when I assert that commission regulation has brought about the conditions which have made this possible. It is more than a coincidence.

Regulation has protected the investor in the securities of operating companies; it has aided financing of proj-

ects; it has prevented destructive competition; it has given the industry stability.

So far as Missouri is concerned, I believe that it has accomplished these objects without sacrificing the interest of the consuming public. A study of comparative electric and telephone rates will show that the general level of rates in Missouri is among the lowest in the United States.

The commission will not merely sit back and wait for the public or the utilities to present cases to it for decision, but will be vigilant to search out and correct abuses on its own motion. There is a clear line separating muckraking from the honest and vigorous performance of public duty and the Missouri commission will never cross that line. It will act as promptly and energetically to protect the rights and property of the utilities as it will in the protection of the public.

The commission hopes to inaugurate a new service if the General Assembly will give us the appropriation recommended by the budget. We plan to have two inspectors who will travel over the state to ascertain whether public utility services are satisfactory. If complaint is made the inspector will analyze the difficulty and report to the commission. The utility will be notified and the commission will co-operate with the utility to correct the situation. In this way complaints to the commission can be anticipated and steps taken before matters reach an acute stage. We believe that we will be able to render a real service to the public utilities and the public in this state.

I believe that the people of Missouri are conservative and not easily led by agitators into experiments and crusades. They will react favorably to fair treatment. It is my firm conviction that

the future course of utility legislation and the prosperity and welfare of utilities are dependent upon two things: (1) the conduct of the utilities themselves, and (2) the efficiency with which the Public Service Commission performs its duties.

▼ ▼ ▼

One Way to Avert the Power Issue

An Interview with

GEORGE H. MOSES

U. S. Senator from New Hampshire

THE political difficulties in which the power industry finds itself today are the result of three factors —utterly ineffective public representation, unintelligent approach to the legislative mind and absentee landlordism. Power is on the verge of becoming a political issue, but that is not inescapable. If the leaders of the industry show sense and do it promptly the industry can be spared the fate of the railroads. The political mind sees potentiality in the question for campaign purposes, but the political mind also sees the channels by which that appeal can be stripped of its value as an expedient.

There should be an immediate improvement in the character and the caliber of those who function as exponents of the industry, dispense its information and keep tabs on the growing statutory limitations that affect every kind of business, including the electric power industry. Such a committee should make the facts of the business openly and indiscriminately available to every one interested. It should be the fountain source for all authenticated facts which the public and its congressional and legislative representatives should know. At the same time such an agency should gently and discreetly, but nevertheless firmly, call the attention of every publication and every public speaker to errors in their public pronouncements. If the error is one of judgment or opinion on a semi-tangible phase of the subject, then the effort should be made to transfer that topic from the realm of conjecture to the realm of fact.

An agency of that kind should engage in neither lobbying nor propaganda. Lobbying and propaganda both belong to a closed chapter of the book of politics. Domination of legislatures is a relic of even more remote an era. Many a state legislature of the old days was in bondage to the railroad managements of those times. Much as such domination was to be deplored, I look back upon that period as not being wholly reprehensible. At least it must be conceded that the state budgets and taxes were on very modest scales as compared with today's orgy of taxation and expenditure. The railroads did give an object lesson in governmental economy when they held the reins. Nevertheless the abuse of the privilege of power in many cases surpassed the beneficence that was contributed through the medium of efficient governmental organization. The railroads have been chastened.

Public temper is absolutely averse to lobbying of the sort that engages in devious, obscured maneuvers to secure preferential treatment. When I refer to an effective organ of public representation I think of something wholly different. National and state or regional agencies can be effective focus points for assembly and dissemination of the public information. Many of this country's industries find they need to keep posted on public thinking about their plans and activities. The utility business is in this group. Any of these businesses is entitled to the privilege of calling to the attention of editors and public speakers the errors they occasionally make in

commenting about those businesses. But as for reminding any editor that your business is a source of lucrative advertising, well I have been an editor long enough to know how little good that suggestion accomplishes.

The logical approach to any legislative representative is through his constituents, especially the influential ones with whom he contacts during recess periods. No senator or congressman can be versed in all the multiplicity of problems which confront the branches of the government. For many of them he must rely for guidance on the cross-section of his best-informed constituents. The more he learns they have firm convictions on the issues on which he will vote, the more likely his vote will be based on exploration rather than expediency. This is especially true of new members of the Congress. If the power business fears that unfair and unfavorable legislation will result from political attack, it needs only to expound the fallacies and clarify the issue with a relatively small group of key persons. These are the community bankers, merchants, lawyers, doctors and other well-informed citizens whom the congressman meets when he is back home. If they are sold on the idea of local satisfaction with their utility, if they see no call for federal regulation, if they see more benefit in holding companies than unorganized industry, if they even partly grasp the intricacies of utility rates and finance, then their intelligence can be relied upon to ask their member of congress to consider their opinions. Naturally the reverse will be the consequence if they prompt him to believe that rates are inexcusably high, financing devious and unethical, community contributions exaggerated and the public skeptical and disgruntled.

The power business is an intricate one. It would take a generation to educate the general public in its complexities. I doubt whether the people will ever be interested in the power business problems to any greater extent than to invest their dollars in its securities or spend their dollars for its service. In either case they are content when they get their money's worth in dividends or kilowatt-hours. But so long as all but an infinitesimally small part of the public can believe that complexity is a screen for chosen obscurity, then that obscurity converts the question into an issue. Campaign issues are best built on problems more or less clouded in uncertainty and susceptible to concoction of glib phrases which no logic can answer.

Electric power in this country is a national issue in the sense that it is an essential ingredient of our economic and industrial fabric. But it need not be a political campaign issue. The months from now until the reconvening of Congress and those next summer which precede the active fall campaign are ample to secure for the power industry, or any other industries, whatever freedom from oppressive legislation they honestly deserve. But the industry must recognize that it is in politics, that it cannot avoid it, and must therefore use 1931 methods in any effort to escape the fate which the railroads enticed upon themselves. The right method would put before the business and professional groups of this country in one week's time enough sound, logic for every individual to determine whether he wanted his representative in Congress to vote for or against the Muscle Shoals bill, for or against federal regulation of transmission, federal regulation of holding companies or anything else that may grow from the effort to make power a campaign issue.

Senator Moses

The Senator was asked by an editor what he would do if he were in an industry faced with the threat of oppressive and repressive legislation as a mere incident of party or factional expediency. It was suggested that he imagine himself to be for the moment the Will Hays or the Judge Landis of the light and power business.

Several of the suggestions made by the Senator have for long been the established practice of certain utility companies. Every company should, however, find the political analysis applicable and welcome under the present conditions of political assault.

Just to show you how ineffective past methods have been, I'll tell you what I once told some of the agents in Washington. I asked them if they would all gather in my committee room and tell me what it cost in the aggregate to keep them there. I felt safe in wagering that for one-quarter of that sum I could get help enough to do a far better job and still save out a handsome salary for myself.

One final thought. The electrical business is drifting toward the same kind of absentee landlordism that was a plague to railroad public relations. Good sense dictates that the confidence-inspiring local management be retained after the consolidation. That, plus the credit for reducing the price of energy and establishing a highly stabilized medium of investment, is a potent factor in holding the esteem of the public. Add to that an enlightened understanding of the industry on the part of strategically placed citizens, and the industry can then rest assured that mere demagogy will avail nothing to hoist an essential industry on the halyard of any party's flagpole.

I do not look for the power issue to loom large in either the Republican or Democratic conventions. Nor do I think that a third party can ride to eminence on the issue. It certainly cannot if the power barons quite properly nip the budding issue.

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Developing the Home Market

Six times the present business available.

Suggested studies for improving distribution and sales mechanism.

The community plans and the national plans.

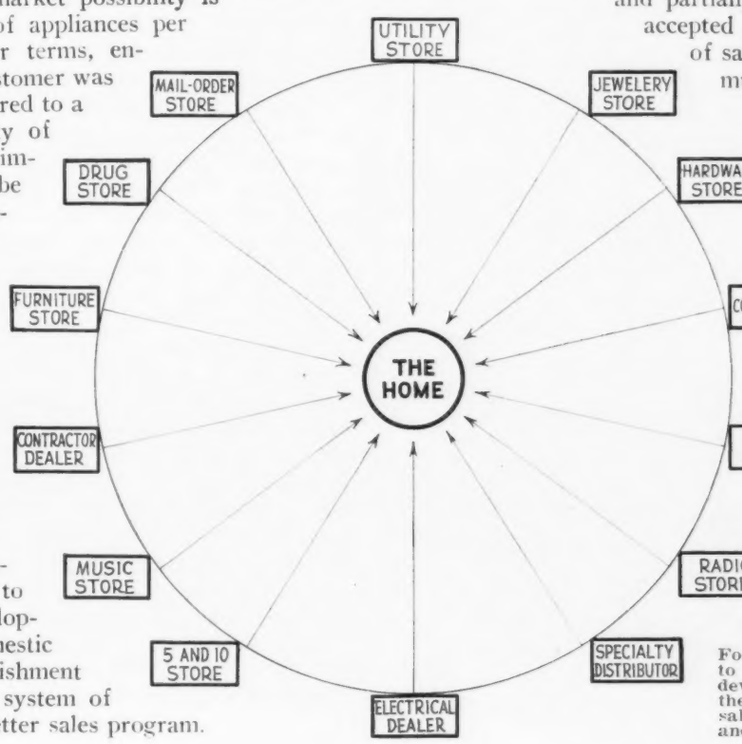
IN THE 20,000,000 wired homes of this country there is about six times the present business for the electrical industry. To supply this market the appliances, wiring devices and services are ready and available. Customer acceptance is had for this volume of business and the expenditure for it is well within household budgets. Yet the industry is making slow headway in supplying this market. It is not even keeping up with new equipments and services that are developed, such as air conditioning, house heating and television. Only a lack of business competency can explain this situation. No matter how difficult or complex the problem, the industry must arrive at a better and more efficient distribution and sales mechanism to reach this market.

A typical sample of industry approach is found in the fact that utilities sold about $7 worth of appliances per domestic customer in 1930 at a unit sales expense of about $3, yet the market possibility is easily $400 worth of appliances per customer. In other terms, energy revenue per customer was about $32, as compared to a reasonable possibility of $75 per customer. Similar examples could be quoted for contractors, dealers and other electrical sales outlets to the market. Sales values are low, sales expenses are high and the rate of market development is slow. A cumbersome and inefficient mechanism is not getting results. The industry problem is to expedite the development of the domestic market by the establishment of a more efficient system of distribution and a better sales program.

One suggestion for improved domestic selling is the suggestion that in each community each industry salesman should, at one sale, sell each home all the electric appliances, wiring and services it needs or desires. This is the application of selective marketing, multiple selling and economical personal selling to this market. The theory is good, but the practice is difficult. Appliance selling must be based upon:

1. Degree of customer acceptance of each appliance.
2. Development of greater customer acceptance for each appliance and greater convenience in buying.
3. Allocation of appliances to economical and efficient distribution and sales channels to meet the customer acceptance and buying conditions for each appliance.

A lamp, for example, has complete customer acceptance, therefore it should have the widest possible distribution if maximum sales volume is desired. The water heater, for example, is at the other extreme, in that it has very little customer acceptance and volume sales can be had only through concentrated and highly specialized channels. Customer acceptance for pioneer appliances must be built from zero to 100 by personalized selling of an educational and highly skilled character. In between the lamp and the water heater come vacuum cleaners, washing machines, ironers and other appliances that partially require personalized and specialized selling and partially can be sold as completely accepted articles. Thus with volume of sales as the gage all appliances must be grouped into several classes based upon their degree of customer acceptance and then allocated to adequate distribution channels. Nor should it be forgotten that appliances shift in degree of customer acceptance with time and the distribution mechanism must be sufficiently flexible to care for these changes.



All sell the home

Fourteen sales outlets attempt to sell thousands of electrical devices to the home owner. Can these outlets team to get one sale per home for all appliances?

But after sales volume based upon degree of customer acceptance is determined it is necessary to study the economics of distribution.

The goal is to get each appliance in volume to homes in the most economical manner.

For example, the lamp should have the widest possible distribution, but is it economical for the drug store, the grocery store and all other stores that give customer contacts to sell lamps? Some may sell only $50 worth a year, others $100 and still others $10,000. What is the gage to apply and the limits to use for fixing the economies of operation for these sales outlets measured from manufacturer to consumer?

At the other extreme are the pioneer appliances, such as ranges, water heaters and possibly refrigerators. Refrigerators, for example, may be set up for sale by the use of a national distributor scheme, with a warehouse in each community and specialized home canvasser salesmen. What are the relative economies of this method as compared to the use of utilities and electrical dealers? What are the unit limits? In some communities, for example, old and reputable electrical dealers have a more or less permanent and friendly group of customers to whom they could sell a certain number of refrigerators easily and cheaply. Should they be eliminated in favor of distributor selling, or can the two agencies be made to sell in co-operation? Then, again, why should not a refrigerator distributor handle other pioneer appliances, such as ranges and water heaters? It is claimed that sales pressure per appliance and sales skill per appliance reduce in proportion to the number of pioneer appliances sold. Is this correct, and if so, how can it be changed over a period of time so as to get the economies inherent in multiple purchasing and selling?

Thus an analysis of markets and a set-up to get maximum volume of sales per appliance must be followed by an analysis of the economics of distribution channels. And back of the facts lie the limitations and variations in human beings, localities and salesmen. It is a complex and difficult task to write a specification to change "business adrift" to "business controlled." Too frequently it leads to "business aground," which is worse.

To sell to the home all appliances by methods fixed by their degree of customer acceptance and by methods that return a profit to the sales outlets requires a complex distribution and sales set-up. This complexity may be visualized in the form of a community electrical store with ten to fifteen departments. One department would sell pioneering appliances with outside field salesmen and demonstrators, and might even subdivide itself for the sale of each pioneer appliance. At the other side of the store would be a department for the sale of accepted shelf appliances, such as lamps, toasters and irons, by means of store salesmen and store displays. Intermediate departments would be partially store sales and partially field sales. Accounting systems would be devised to care for each department. Advertising and sales promotion literature would have to fit departmental needs. Management would have to be sufficiently flexible to permit interdepartmental shifts in appliances as their degree of customer acceptance ebbs and flows. Each community, to get wide distribution, would have similar stores for, say, each 500 customers.

This type of store can, in turn, be visualized and magnified into a community in which the sales outlets must conform to the store departmentalization. All stores of a standard type should handle irons, toasters and lamps. Specialty stores should handle the appliances in some of the intermediate departments. Other specialty stores or distributors should sell the different pioneer appliances.

This type of community distribution is based only on volume sales to households. Even so, it would be difficult in any community to subdivide and restrict sales outlets to accord with this allocation of the appliance business. Each sales outlet wishes to sell any or all appliances that afford a margin of profit and each wishes to handle as many appliances as can be crowded into the store or sales program.

So customer acceptance is a gage to market volume selling, but it is not sufficiently convincing to be adopted by sales agencies unless united with proof that dollars and cents profit or loss will show selective selling and marketing to be good business.

The economy of operation of each sales outlet with each class of appliances must be established so that self-restraint and proper sales allocations will be practiced by the informed sales agencies in each community.

But costs and facts about distribution of electrical appliances are meager. Too much appliance business is done on a gross basis of total sales, total expenses and total profit or loss. Accounting systems are not uniform and are not detailed or not allocated to classes of appliances. Purchasing methods and discounts vary greatly. It is indeed difficult to fix distribution upon any basis of cost facts.

One bugbear in the situation is adequate wiring of old and new homes. There is little customer appeal in wiring and either it should be sold indirectly as part of a service and equipment sale or it should be regarded as a part of the service facilities. The approaches to the wiring problem are:

1. Study the possibilities of considering the house wiring or part of it to be part of the utility distribution system. Tradition and custom only have fixed the meter as the limit to utility distribution. The telephone company wires to the telephone in each house. There may be very good reasons for or against extending the utility distribution system to the service outlets, but these reasons should be stated and studied.

2. Study the possibilities of getting complete electric service and appliances sold to each home on an installed cost basis whereby wiring is taken care of by an internal industry arrangement between contractors and the utility. For example, range service extensions are made by some utilities at present through arrangements with local contractors. But the wiring for the range is the wiring needed for all heavy-duty service, and it would be better possibly to consider the wiring in connection with full-use service such as refrigeration, water heater and range.

Nor does range wiring provide outlets or adequacy for other services and appliances in the home.

3. Establish a plan and a program for the adequate wiring of all new homes. This should be co-operative with home owners, architects, utilities and contractors. All should work together and should be provided with a definite plan for adequate wiring and for securing adequate wiring in all new homes built in each community.

Wiring is a needed preparation for market development, but it has very little customer appeal. It should be taken care of by some internal industry arrangements as part of the larger sales program to homes. At present price competition for wiring jobs exerts a pressure to limit the adequacy of wiring.

Local community effort

From the conditions outlined it is apparent that present methods cannot be changed quickly or readily. Nor is it possible to state a national plan or mechanism that can be applied universally. But both local and national efforts can be used to improve conditions gradually and effectively in the light of facts and the application of sound business principles.

The local effort should start in each sales area with the formation of a voluntary association of all electrical sales outlets and the establishment of a competent business research worker or workers as a major part of the association effort. Execution of this association should next outline a definite plan for local distribution and market analyses to be conducted under the auspices of the association. At first the organization should be skeletonized and inexpensive, but it should be expanded as the work develops.

A start at the task is to study conditions; for example:

1. Market saturation and market availability by region, by electrical products, by electric energy use, by customer income.

2. Volume sales analysis by products for each sales outlet and summary data by type of outlet.

3. Price and payment practices by each kind of sales outlet for each class of products.

4. Purchasing and accounting practice of each group of outlets for each class of products.

5. Product analysis based upon an analysis of the economies of operation and sales volume of classes of sales outlets. For example, (a) to do 85 per cent of the total sales volume requires how many outlets? (b) a 10 per cent net profit margin is had by how-many outlets?

6. An analysis of the contractor's business and his sales volume and profits.

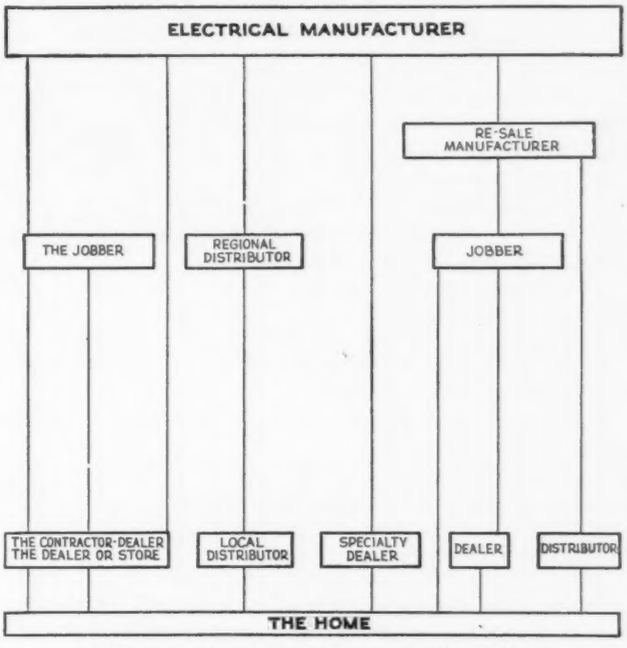
7. An analysis of the jobber and distributor business and practice in the community.

From the facts and opinions developed by a close analysis of existing operations in each community it should be possible for association executives to present a community plan and program for more rapid and more economical market development. This plan should embody selective marketing and selling principles, statistical controls, co-operative sales efforts for wiring and appliances, co-operative advertising, maintenance and customer acceptance development. It should classify products to be sold in terms of sales outlets and fix reasonable factual limits on a volume basis.

This seems to be a difficult and complicated task and one not quickly and readily done. But it should be started and developed, and the fact that Poughkeepsie, Fresno, Vancouver and other localities have done something of this kind is evidence that it can be done. The start is an association with a competent staff.

But the local efforts to arrive at a better distribution and sales plan links up with national plans and policies. Each appliance manufacturer should make his own market analysis and determine his own economical channels for distribution. If one arrives at the solution to, say, the refrigerator, by use of distributors and another by use of dealers, then a national association of electrical trade groups should have a skeleton organization and a business research staff to check the different analyses and conclusions.

Each product on a national basis should receive a market study and a distribution channel study premised upon arriving at the most economical distribution and sales mechanism for getting volume sales. Any such study would result in an improved national plan, even though local modifications would need to be made. And each local study or plan would aid the national study.



What are the economical trade channels?

The industry problem is to determine the economical trade channel for each of thousands of electrical devices for the home market in order to get maximum volume in sales most economically.

Thus the only feasible approach to the domestic market is:

(a) Sell as hard as possible with existing agencies.

(b) Study and analyze each local situation and try to develop better local practices and organizations.

(c) Study and analyze the national situation and unite the individual manufacturer studies and local studies into a national plan or plans that will meet conditions to the best advantage.

The domestic business is here and it is large enough to deserve research study and industry attention. Enough of this is now going on to show that the industry will measure up to its opportunities. Customer acceptance of products plus customer convenience in buying through an economical distribution system will attain the sales volume desired.

Engineering Follows New Trends

Cost reductions, increased reliability and simplification mark engineering progress.

Standard factory-built assemblies used.

New research developments made commercial.

THE business depression has acted as a spur to get new and better engineering. Economic pressure to reduce costs and increase sales, spare time for analysis and planning and spare facilities for bringing out new or redesigned equipments united to bring advances in engineering.

Utility engineers have looked at the entire system and applied engineering analysis to bring about:

1. A reduction in the number of system voltages.
2. A greater use of a unit assembly of standard equipment for each functional duty.
3. An improved use of existing structures and equipments.
4. A reduction in numbers and type of apparatus through simplification and standardization.
5. A planned program for system growth.

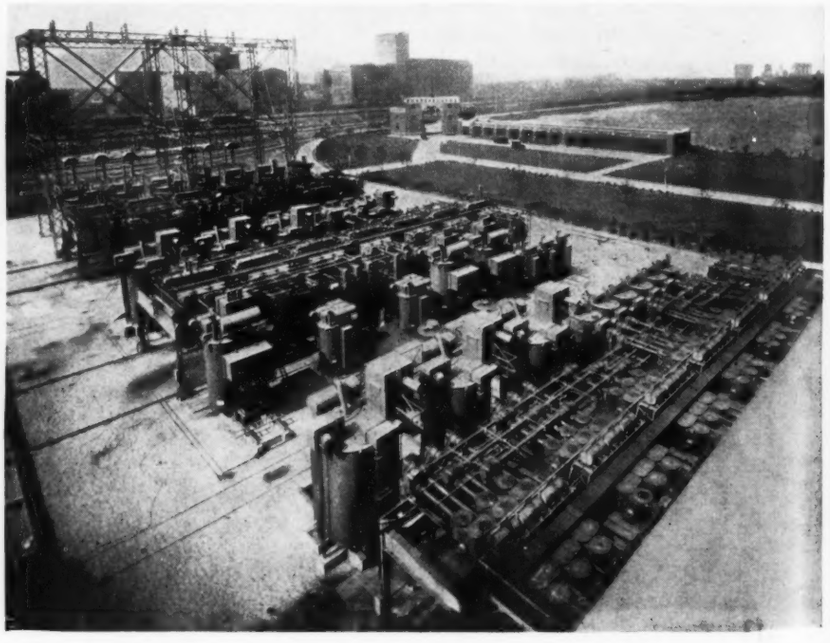
The manufacturers have co-operated in these endeavors and, in addition, have contributed to business and the art. They have brought out new apparatus that embodies the results of recent researches and they have improved upon their production processes and methods to get better and cheaper apparatus. They have helped develop special and new equipment for new electrical applications in both the utility and industrial fields. No year in the past has been more fruitful in bringing about advances in engineering or improving existing equipment and practices.

Multiple Power Stations — Power production reaches maximum economy and reliability for a region by reason of the use of multiple hydro and steam stations located at load centers and tied together by diversity and emergency service transmission lines. Greatest economy in power production has resulted from low fuel costs and a reduction in capacity charges by using unit, high-rated, simplified generating assemblies that consist essentially of a boiler-turbine-generator-transformer arrangement. This unit of generation is being simplified to approach the ideal of one line of auxiliaries and one control station for the entire assembly. These changes have made it possible to meet a cost figure of $75 per kilowatt of capacity for a 12,500-B.t.u.-per-kilowatt-hour station in some instances.

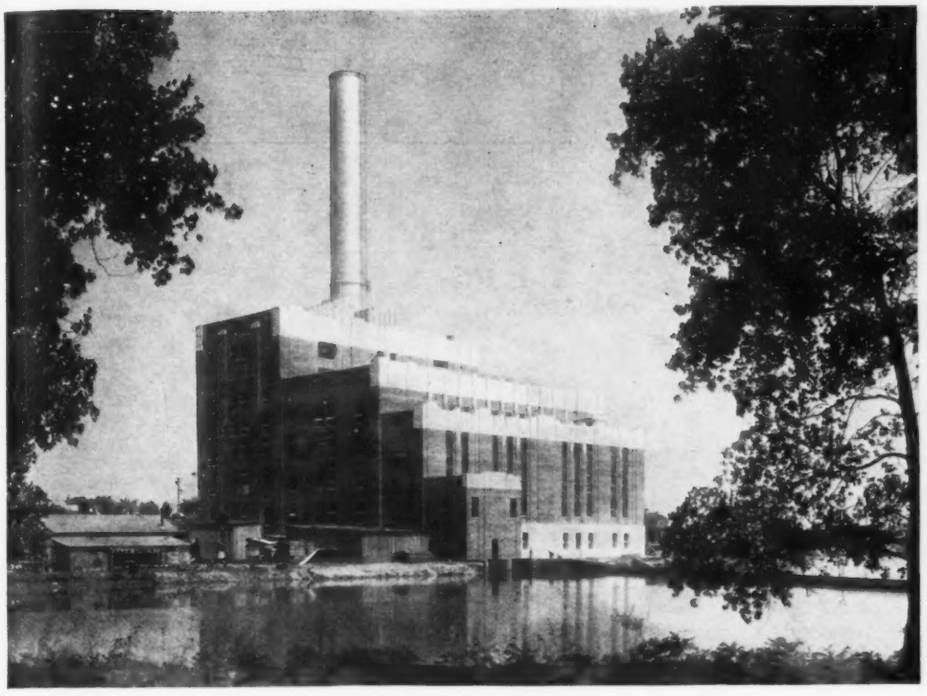
The day of the single large generating station with extended transmission lines to load centers appears to have passed in favor of the multiple station principle, and present trends are toward even greater simplification and cost reduction by use of completely outdoor installations and new developments such as mercury turbines, hydrogen cooling and higher pressures and temperatures.

In the hydro-electric field the outdoor and automatic features continue, but the political and legislative restrictions and hecklings unite with the increased economy of fuel-burning plants to cause a slowing down of hydro building plans for future use. Very serious economic and service handicaps to hydro-electric developments have been created.

New Power Developments—In the general field of power equipment the trend has been toward simplification and use of high-rating, high-capacity units. The mammoth turbine is not the center of economic interest so much as those of comparatively small size, 50,000 to 100,000 kw., that fit into the condition of multiple station generation to better advantage.



The switchyard of State Line generating station illustrates the trend to factory-built, metal-inclosed apparatus



The 220-kv. system marks the top economic transmission voltage under present conditions and there is agreement upon a plan to reduce the number of transmission voltage levels used in subsidiary systems, with 132 kv. as the favored level for high-voltage installations. The 220-kv. line is ample to serve as a diversity or emergency tie between adjacent large power areas, and the promising developments in d.c. transmission also postpone the use of 300-kv. or 440-kv. lines because of the possibility of raising the capacity of lower voltage lines.

In addition to improvements in boilers and turbines there are new developments. The mercury turbine is on the horizon to rehabilitate old stations or to be used in process steam plants. The Detroit experiment in high temperature is watched with interest. New attempts at higher pressure installations are being made. The diphenol and other two-fluid cycles are being investigated and the gas, oil and Diesel engines are coming into prominence as power producers in certain sections.

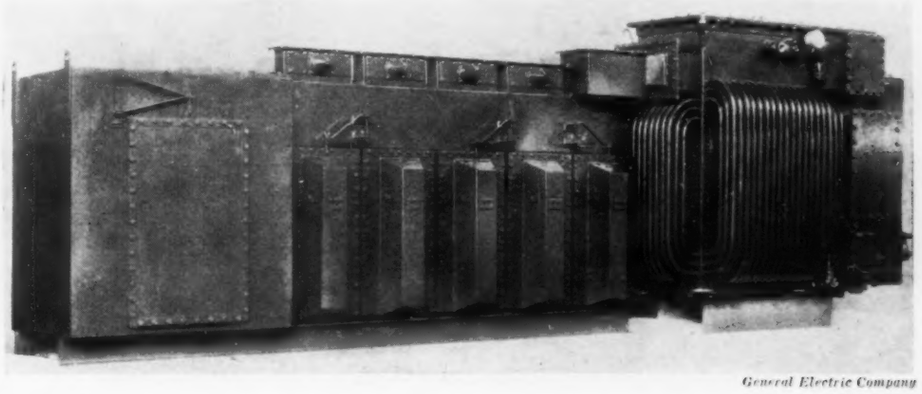
A significant trend in power production is the extension of power loads into process steam and other industrial plants. Based upon the premise that a utility is in business to make power and operate plants at a location and by a method that is most economical, the private industrial power and steam business is being approached upon the basis of the utility owning, renting or operating industrial power stations as part of its system operations. This is a new policy and opens up a very large field for business activity in private industrial plants.

Transmission Practices Change—With reductions in the costs of power production and the increase in reliability requirements it is evident that the art and the economics of transmission have been affected. These have taken the form of a reduction in the economic distance for transmission, an improvement in the reliability of transmission lines, a change in the design of lines and a reduction in the necessity for using so many voltage levels in transmission.

In the overhead transmission system attempts are now being made to make lines lightning proof even against direct strokes. This requires insulation up to 20,000,000 volts and a path to ground of very low impedance in contrast to the ground path made up of a line conductor and insulator. Ground wire shielding of power conductors with space to ground of 25 to 35 ft. and even a counterpoise at tower footings are methods now advocated for protecting high-voltage, high-capacity lines. The adoption of these ideas will result in radical changes in steel tower line structural arrangements and designs. Lightning-proof lines can be made and the economics of particular installations will determine whether they will be installed.

In the lower voltage lines the use of wood poles and wood for insulation continues to be popular, including the use of ground wires and pole grounds. Many field data remain to be gathered, however, before proof can be had of the economic effectiveness of this construction against direct strokes of lightning.

For metropolitan areas with large power capacities—located in multiple stations—the high-voltage underground cable type of transmission has been used succes-



A 1,500-kva., 4,000-volt factory-built substation

General Electric Company

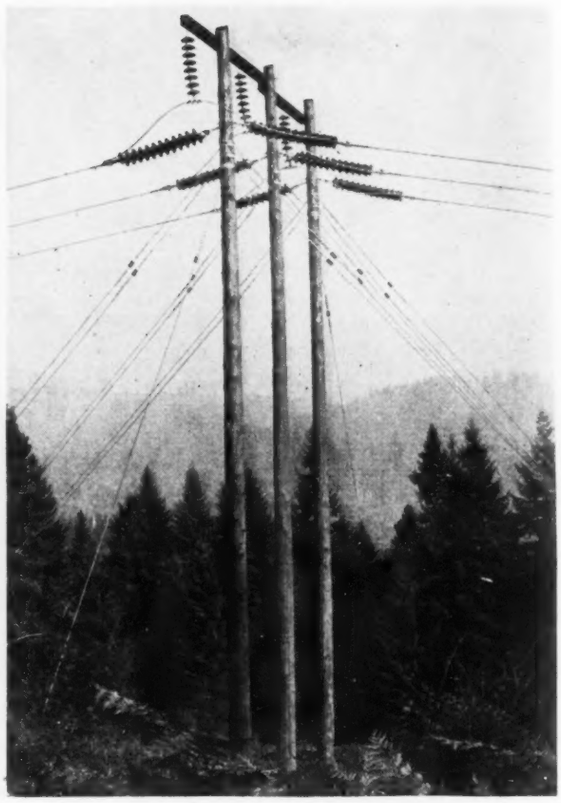
fully. Both in New York and Chicago these cables have performed well and further applications will be made.

Increased use of long-distance power transmission and interconnection is not very apparent because of recent economic and service changes. Regional network transmissions with transmission ties between areas appear to be the present trend. Standard and fewer voltage levels are sought and transmission equipment, such as insulators, ground wires, towers and line hardware, appears to be very satisfactory and is meeting with increased standardization and simplification. After several years the fundamental checks for line stability have been made and a more complete knowledge is available as to the use of arcing rings, arcing horns and lightning arresters.

The picture of the future transmission is a network consisting of a few voltage levels in each power region supplied by multiple generating stations and tapped to multiple load centers. Service reliability and relative costs will fix the proportionate use of overhead and underground circuits for each area.

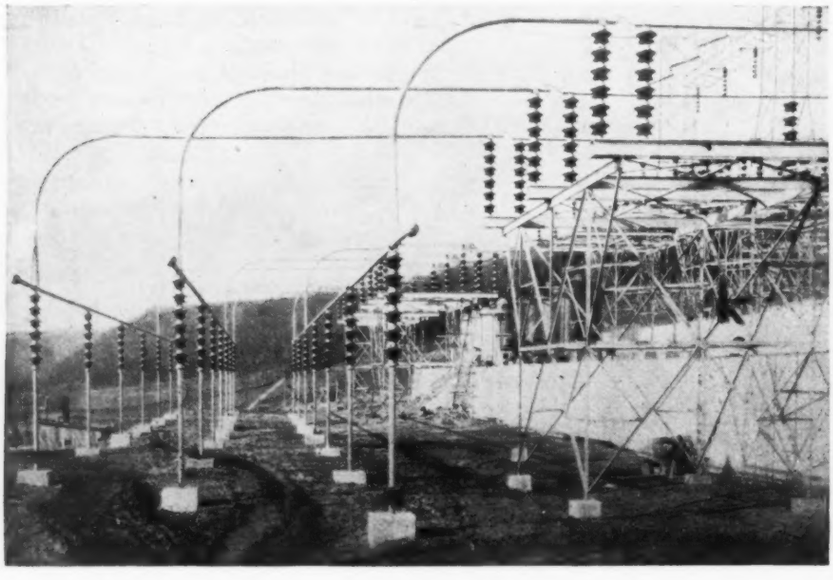
Substations as a Standard Assembly—Substation art and practice is becoming more standardized through the application of the principle that a substation is a functional installation—an assembly of apparatus to step up or step down voltage or to perform switching operation between systems or loads. Instead of detail design and construction, attempts are being made to have standard factory-built assemblies that may be placed above or below ground. This assembly is based on oil or compound sheet steel fabrication and complete metal inclosure of all equipment needed to perform the substation function. Meters, relays, transformer, voltage regulator and oil breakers are put together as a unit assembly in a factory. This leads to lower costs, the use of standard equipment, the elimination of specially designed buildings and individual apparatus. The 4,000-volt, 1,500-kva. network type of substation is an example of this trend, as are the steel-oil-filled substations used by the Public Service Company of Northern Illinois and other utilities.

This class of substation is economical and practical for voltages below 66 kv., but for higher voltages the structural air-insulated outdoor substation seems to be more economical and practical. This type of substation, however, is also getting more standardized as to design and as to apparatus used. One of the current problems of the industry in connection with the higher voltage substation is the co-ordination of its insulation with that of the system. The most economical approach is to shield and protect the entire substation and the line adjacent from direct strokes of lightning and line surges by means of ground wires and low impedance paths to ground. The alternative is to raise the insulation levels of substation apparatus—an expensive and difficult task if lightning-proof insulation is desired.



A wood-pole insulation line with 2,100-kv. arc-over insulation

Distribution Going to Network—For local distribution of energy in an area it is becoming apparent that the idea of a network for each voltage level is most economical and serviceable. The 120-208 network has proved very successful and has had a great influence in making it possible to use standard factory-built substations and other equipment. One rated cable, breaker, transformer, etc., is found applicable to



Pillar type bus substations find favor for 220-kv. installations

Electrical heat treating applied to tools and dies

the majority of systems. A recent innovation is the use of the same ideas for the 4,000-volt distribution level. Here a factory-built substation rated 1,500 to 2,000 kv., with associated apparatus, has been developed to use where needed on a 4,000-volt network.

Apparently the trend in distribution is to go directly from generating voltage level to utilization level, thus pointing the way to the future elimination of the 4,000-volt and 2,300-volt systems, except for special cases. The generating voltage network will step down to the utilization network in a standard functional assembly that is factory built and the full advantage of national standardization in rating and design with factory mass production should result in appreciably lower costs.

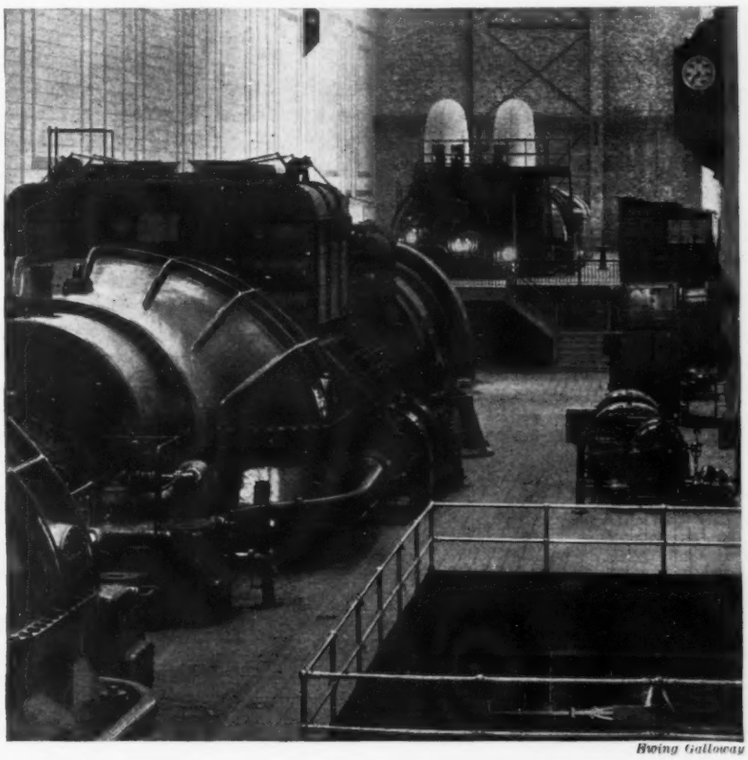
New Industrial Applications—In electrified industries there is steady progress in the art and practice. Each industry is coming to rely upon electricity for light, power and process work and electrical equipment is keeping pace with industry demands. Special designs of motors for high-torque, precision-speed control and special-duty cycles have been developed by manufacturers.

In the electrochemical field recent developments are tungsten plating, deposition of metals and the commercial electrolytic production of hydrogen and oxygen. Electric welding is gaining rapidly in favor for metal fabrication and building construction and new welding machines and contents have been developed.

The photo-electric cell and the vacuum tube are becoming of increasing importance in power applications. They are used as relays, meters, controls, inverters, amplifiers, converters and switches. They make possible new applications of electricity and promise to replace many electromagnetic types of equipment in the near future.

Oil breakers have been improved greatly and several promising researches are being made on new types of circuit interrupters. Two new types of lightning arresters have been brought out that are improvements on older forms. Turbines, generators and motors have been redesigned and perfected and the usual electrical equipments used by utilities and in industry do not present any particular problems that affect operating efficiency or maintenance. A gradual improvement in design, a greater use of standardization, the use of better materials, the application of better manufacturing — all these produce quality electrical products.

In summation the engineering trends in the industry involve: (1) Prosecution of promising researches. (2) Development of new and better devices. (3) The application of standardization and mass production principles. (4) The use of a larger perspective whereby functional assemblies and the future requirements are made yardsticks for decision.



Irving Galloway

A 60,000-kw. turbo-generator (foreground) and a 160,000-kw. turbo-generator (rear) in the Fourteenth Street station of New York Edison Company

Ewing Galloway

Power Exchanges Will Open Markets

—Interesting service opportunities beckon.

—Attack difficulties by case method.

—Fix policies by engineering analysis.

AS THE pressure upon power systems to market service on price bases competitive with the other resources increases utility executives and manufacturers are more and more considering the possibilities of power interchange on mutually satisfactory grounds. In a word, the salvage of surplus generating capacity existing from time to time in both industrial and utility hydro-electric and fuel-driven plants is taking its place among the issues of the conference table which can neither be waved aside as too delicate a question for discussion nor dismissed as unimportant on account of the insignificant total such electrical production bears in general to the total output of utility plants. The problem is here; it is being solved in many localities by co-operation on an economic engineering basis, and precisely this kind of analysis is ridding it of many complications which have hindered its settlement in the past.

The combinations and complications of industrial-utility power exchange appear almost endless. These result from the sizes and varieties of plants, differing characteristics of industrial processes, load factors, working hours and habits, and last, but not least, the personal viewpoints of both industrial and utility executives. Heating requirements multiply the difficulties of the situation many-fold and open the door to considering a class of utility service combining heat supply with electrical energy delivery and purchase, participation in industrial plant investment and operation, partial or complete responsibility for service and a wide range of co-operation which may run far afield from the service needs and customs of earlier days. Out of all these complex factors, however, arises the conclusion that the establishment of co-operative relations of some sort applicable to virtually every individual case is at least possible in theory. No general statement can be made that interchange should be adopted wherever idle capacity in industrial generating plant is available, but every such situation may be subjected to engineering analysis with full expectation of making a close approach to a correct decision.

Under conditions which warrant interchange, both industrials and utilities benefit. The industrial sells a certain amount of surplus power which the utility can

use elsewhere to advantage at the time of delivery. Obviously the kilowatt-hour rate received for such energy must usually be low to make it worth while for the utility to handle it in competition with its own increment costs. In one group of industrial plants selling surplus to utilities last year the prices received by them ranged from 1.8 mills to 7.5 mills per kilowatt-hour and the total sales of energy from 115,000 to 3,000,000 kw.-hr. The total purchases of energy from industrials were generally a fraction of 1 per cent of the system output, although occasionally these ran between 1 and 2 per cent. Such figures indicate that these transactions are relatively more valuable to the industrial than to the power company, but they do not tell the whole story. The willingness of the utility to buy surplus from established industry plants may in some cases turn the decision in favor of buying central-station service on account of the reduced net cost of power for the year to the industrial, or, again, the time of delivery of industrial dump power may be favorable to the utility peak-load supply and may reduce or postpone investment to supply increment power. The industrial dump power may arrive at a time when it saves operating additional generating capacity of the utility system at inefficient points on the machine or boiler curve, or, on the other hand, it may be offered at a time when it cannot possibly compete with the utility's increment costs.

Essential Steps in Successful Interchange

1. **Complete analysis of mechanical and electrical service requirements.**
2. **Determination of co-operative scheme best suited to situation.**
3. **Conference to discuss service requirements, select scheme of co-operation and establish working agreement insuring most reliable and mutually profitable basis of interchange, terms and investment allocation.**
4. **Selection of high-quality equipment to insure reliable and efficient service.**
5. **Provision of adequate protective apparatus to safeguard utility system and industrial plant.**
6. **Standardization of operating responsibilities and procedure in harmony with best utility and industrial engineering practice.**
7. **Institution of complete and mutually satisfactory metering practice.**
8. **Make provision for emergency service in each direction.**
9. **Provide for periodical check-up of value of interchange arrangement.**
10. **Arrange for modification of agreement to meet changed conditions.**

These considerations again point to the necessity for attacking every case on its own merits and providing agreements flexible enough to enable each party to take advantage as far as possible of load conditions in utilizing surplus. The time element in surplus power delivery is of overshadowing importance, along with the coincidence of demands for building or process heating. Furthermore, the investment aspects of surplus power production and utilization are of extreme significance. Energy wasted over dams during light-load periods in factories controlling such water privileges may justifiably be diverted into utility systems if the conditions on the latter are favorable, and only then. Full information on utility production over-all costs and indeed on transmission and delivery costs to zonal areas within striking distance of dump power from industries must all be fitted into the picture before a true perspective can be had of the course to pursue.

Plenty of reasons why power interchange with industries may involve difficult situations can be brought upon the stage from the more conservative wing of industry thinking. These considerations must be faced and weighed fairly in every case. They may kill the possibility of interchange in the first half hour of conference, or they may in particular cases be surmounted. Classed as disadvantages, they make an imposing list, even in part. Among these are:

Possibility of having to face the charge of discrimination in cases where the utility chooses to make a working arrangement with one industrial and to deny it to another.

Hazards to service presented by a number of small, isolated plants whose engineering and operating standards may be below the utility grade.

Complications of supplying process steam non-electrical service to industrials.

Financial hazards and disagreements potential in joint ownership and operation of utility and industrial plant equipment.

Danger of increasing industrial business to an unsafe volume in proportion to total business.

Objection to committing utility funds to investment in power facilities in industrial plant of uncertain business continuity.

Possibility of an industrial plant with excess capacity attempting to sell this direct to users at a higher profit than the interchange rate permits.

Variations in efficiency of industrial plants delivering byproduct electricity as a function of blast or other process heat usage.

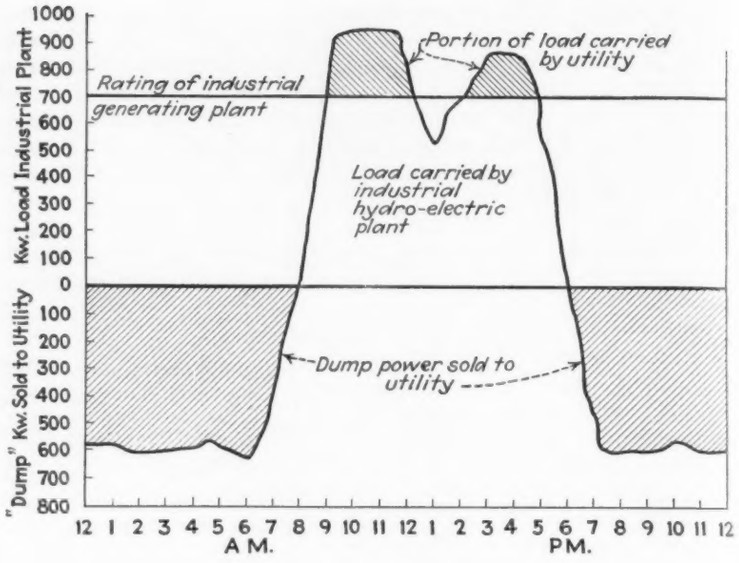
Inflexibility of such byproduct plants as compared with utility generating stations.

Enough experience is now available as to industrial tie-ins to show that many are rendering satisfactory service. In 1930, according to a statement to the ELECTRICAL WORLD by G. S. Williams, vice-president and general manager Central Maine Power Company, more than $13,000 was paid to three industries by this company for about 3,000,000 kw.-hr. of surplus energy. This enabled the utility to conserve its reservoir storage and put profit dollars into the tills of these industrial customers. Besides cash payments, arrangements were made with other industrial plants having small varying amounts at certain intervals to take their surplus energy, enabling them to govern the speed of their generating equipment without the wear on wheels and gate rigging which would otherwise have resulted.

"For the industrial plant competing in an age when every manufacturer must lower the unit cost of his product," states Mr. Williams, "any moneys which he may receive from water which otherwise would pass unused over his dam is clear 'velvet.' For the central station it means that in dry periods water may be conserved at strategic points while the company takes advantage of purchasing power from these industrial

Interchange of energy between textile mill hydro plant and utility during wet season

Mill operated daytimes with power company supplying load in excess of available hydro capacity, at this time 700 kw. At night the mill sold secondary power to the utility system.



plants. In a company like Central Maine, which normally generates around 95 per cent of its power from hydro plants, this means less reliance upon auxiliary steam plants. With the company's new hydro plant at Bingham in operation this year, and a return of normal water conditions, industrial power interchange may be less effective than in 1930, but one plant has furnished a small amount of surplus power practically every day since February 1, totaling about 67,000 kw.-hr. to April 15."

Operating conditions on the Central Maine system vary considerably, and F. W. Eaton, operating engineer, states that there is nothing uniform in the industrial tie-in policy. It is only during periods of low water, when it is necessary for the company to generate by steam, that it takes advantage of the ties which it has between certain of the mills in Lewiston and Augusta. Its ability to purchase power is also somewhat dependent upon the mills' own demand. With the mills running to capacity, there would be no surplus power for sale; in fact, the company would be selling them power. During the last run Central Maine's purchases of energy came primarily between 6 p.m. and 6 a.m., but when the mills were running three or four days per week the company purchased some power during the daytime.

The treasurer of an eastern textile plant with 912 kva. in hydro-electric equipment installed says:

"We have a hydro plant at which excess water goes to waste about six months in the year. We do not run our plant nights and have gazed with longing eyes at the water which went over our dam without doing us any good. We needed more electrical energy in our mill and therefore increased our generating capacity, cutting down the mechanical belt drive by about the same amount and making an arrangement with the local power company whereby we could draw on it for peak loads above our generating capacity. This was later made a reciprocal agreement whereby the power company arranged to purchase from us at any time our excess power at a rate about 25 to 33 per cent of the price we pay it. This low rate was established because our power delivery to it would be intermittent and largely at night, when its needs might be less than at other times. During a year's experience the earnings to us have justified the expenditure, more than covering interest, depreciation, cost of having a night operator, etc. We have known the flow of our stream for 37 years and were therefore able to estimate the average power which we should have to sell. We have nothing but praise for the co-operation of the power company in helping to make the plan a success."

A representative cotton-finishing plant using process steam at an average rate of 30 lb. per unit of product had a coincident steam and power load and a continuous operating schedule. The finishing mill load was 10,000 kw. and the capacity of an interconnected utility plant was 25,000 kw. The tie-in benefited both parties in emergencies. Excess power was sold to the utility at the rate of 4,000 kw.-hr. per day, the price being nine mills per kilowatt-hour. The arrangement was discontinued when the power company built a new generating station, selling its entire output to other utilities. All the power generated by the textile mill was a by-product.

A cement plant using 16 kw.-hr. per barrel sold 10,000 kw.-hr. per day to a power company at 3 mills per kilowatt-hour. This power is of the dump variety and the price is somewhat unusual. The boiler feed water of the industrial is unsatisfactory as to quantity and quality and cannot be wasted through the safety valves. Both parties gain in speed and voltage regulation as well as in power-factor control. Waste heat from the cement kilns produces the power sold to the utility. Normally there is little exchange of power, but the tie-in is convenient and very useful at times.

Another cement plant sells

The Industrial Plant Challenge

Unless co-operative relations are established where economic and operating conditions indicate their desirability, the opportunity for utilities to extend their service into the by-product and waste-fuel industries will be limited. New viewpoints must be adopted in facing these problems and in analyzing the possibilities of power interchange, expansion of service into non-electrical fields in industrial plants, treatment of investment in equipment, and standardization of operating practice between industries and utilities.

10,000 kw.-hr. per day to the utility and buys 2,000 from the power company. The utility buys this surplus at a rate equal to half the fuel cost of generating electricity at its own station, plus transmission cost allowances. Sales to the cement company cover the costs of the equipment set aside for that purpose. As in the first case, the cement company benefits in speed and voltage regulation and derives revenue from its sales of surplus power and the stand-by capacity of the power company.

An unusual case is that of a cement company using waste heat boilers on kilns. The establishment's power and steam requirements consume only about 50 per cent of the actual steam output. By-product excess power is not dumped on the utility at random, but is supplied according to a definite schedule at the rate of 33,000 kw.-hr. per day, the amount being reduced over week-ends and on holidays. The power company can use only one-third of the excess power of the cement plant. The interconnection has cut the cement company's power cost 8 per cent and the utility pays less than its own increment cost for by-product energy.

Another cement plant sells 10,000 kw.-hr. per day to a public utility system and buys 900. The plant is 40 miles from the nearest utility station and is a useful booster in the territory. The rates per kilowatt-hour are not available.

A saw and planing mill burning refuse formerly spent several thousand dollars per year hauling away sawdust and shavings. A contract was made under which the power company installed a turbine to make use of excess steam produced from wood waste. The load on the turbine is controlled entirely by the amount of excess steam available and is a source of cheap power to the utility. The turbine load averages 1,100 kw. ten hours per day. The sawmill turns a former source of loss into a profit by the sale of this surplus power.

Another woodworking plant sold a power company last year 450,833 kw.-hr. at 6 mills per kilowatt-hour. The cost of this energy, $2,704, was an insignificant item in the annual expenses of the power company, but was an appreciable sum to the woodworking plant.

Another saw and planing mill burning refuse sold 12,000 kw.-hr. per day to the utility at 5.5 mills per kilowatt-hour. The plant operated 144 hours per week. The peak was limited by the isolated transformer's capacity, which is 3,200 kva. The agreement permits the utility to call for the entire 3,200 kva. in emergencies.

Another lumber mill burning refuse sells 3,000 kw.-hr. of firm power per day to the power company at 5.5 mills.

A steel mill, producing wire, nails, etc., sells a maximum of 8,000 kw. peak power to an interconnected utility. This power is obtained from blast-furnace gas and is available at night and over week-ends. Steam-heating requirements are negligible and the steel plant operates 60 hours per week during normal times. The actual interchange of power varies widely on account of conditions on the utility's hydro-electric system. When the water supply is ample the utility buys no power from the industrial, but sells energy at 5.6 mills per kilowatt-hour. The computed power cost of the steel mill generating plant is 5.7 mills. The utility regards contracts of this type with high favor.

A sulphur mining plant using a large quantity of low-pressure steam sells surplus power to the utility at about 4.5 mills per kilowatt-hour. The steam and power loads are coincident. Steam is generated at 125 lb., expanded through steam pumps and air compressors and exhausted into the low-pressure system of the industrial. Additional low-pressure requirements are obtained from the exhaust of two 500-kw. turbines. As the power requirements of the industrial absorb the output of only one machine, the power generated by the other is sold to the utility. This available excess is useful to the utility and protects its service on an 11-mile line.

Another interconnection for which no figures are available is with a combination coke, cement and pig iron plant. The utility has a separate contract for waste heat power and by-product power, apart from its sales contract with the industrial. Gas from blast furnaces and coke ovens and cement-kiln waste heat are the industrial's sources of power. In this case the utility supplied the investment for the interconnection, including transmission lines and substation. This is gradually being wiped out by the industrial through energy sold to the utility.

A valuable interconnection between a large paper mill and a power system has been operating for several years. In this case the paper mill plants sell only primary power to the utility and the latter sells only secondary power to the paper company. The power company sold the mill 6,687,850 kw.-hr. in 1930 and bought 888,075 kw. from the industrial. Both systems generate by steam and hydro, but the latter predominates with the utility.

The variations in interchange from month to month were as shown in the following table:

Types of Industrial-Utility Co-operation Available

I—Utility supplies all service.
- **A—Utility owns all plant.**
  1. **Service from existing plant.**
  2. **Service from special plant.**
- **B—Plant ownership distributed.**
  1. **Industrial owns special equipment in utility plant.**
  2. **Industrial owns special plant.**
  3. **Utility owns special equipment in industrial plant.**
- **C—Utility operates industrial-owned plant.**

II—Utility renders partial service.
- **A—Utility owns all plant.**
  1. **Normal plant supplies electric service.**
  2. **Normal plant supplies more than electric service.**
  3. **Special plant for service of one or more industrials.**
- **B—Plant ownership distributed.**
  1. **Industrial owns special equipment in utility plant.**
  2. **Industrial owns special plant.**
  3. **Utility owns special equipment in industrial plant.**

1930	Kw.-Hr. Purchased from Industrial (All Primary)	Kw.-Hr. Sold to Industrial (All Secondary)
Jan.	2,650	813,050
Feb.	4,340	904,400
March	1,900	810,820
April	5,860	659,740
May	10,910	395,450
June	8,135	425,675
July	28,170	263,370
Aug.	102,080	218,180
Sept.	380,160	138,020
Oct.	238,820	73,340
Nov.	57,720	762,400
Dec.	47,330	563,405
Total	888,075	6,687,850
1929	517,060	8,111,091

The interchange is especially useful to the utility in handling its peak loads during low-water periods and to the industrial because of the low price of dump power supplied to it (about 4 mills per kilowatt-hour). The tie-in facilitates operating the power company's local generating plant at a high load factor. A domestic cooking and water-heating load is handled by the power company with a heavy forenoon peak.

Striking variations in the value and cost of excess power sold by industries to utilities appear in the following tabulation drawn from the reports of six power companies during 1930:

Type of Industry	Kw.-Hr. Supplied Utilities	Rate Mills per Kw.-Hr.
Textile	1,466,200	3.69
Woodworking	450,833	6.00
Machinery	13,075	10.31
Textile	1,310,800	5.01
Textile	639,300	4.00
Paper	115,000	6.00
Confectionery	130,500	2.00
Machinery	263,700	7.50
Factory group	258,900	1.80

The amount of power sold to these industries is not yet available, but in many cases an interchange contract is an important factor in establishing and maintaining commercial relations.

It is apparent that in many cases power interchange with industries needs to be subjected to more thorough analysis than has been common to date. Every such case presents an individual economic problem. Informal agreements still exist as to the use of surplus energy when available between utilities and industrials, but while these may work well for a time, it would seem that more permanently satisfactory relations must be based upon more comprehensive surveys and negotiations. In itself the volume of surplus energy available from industries will probably be a trifling proportion of both utility and industrial requirements for years to come. But as power companies expand in usefulness the problem of furnishing non-electrical heat and other mechanical service to industry moves toward the front of the picture.

If policies draw the line at supplying non-electrical service, the possibilities of developing increased business through interchange of power with industries become somewhat circumscribed, but even here tie-ins deserve investigation as a possible means of turning the scales in favor of more utility service under favorable conditions. If policies permit expanding utility service into non-electrical fields and perhaps into the realm of establishing separate plants in industrial precincts or areas to supply varied services, interchange may be the key to a much wider door to usefulness. Well-rounded experience data are needed in much greater volume in order to determine the value of this kind of service and better to define the zone of economic co-operation between power companies, their existing and their potential industrial customers.

▼ ▼ ▼

More Equitable Rate Forms an Industry Obligation—

Contends

T. O. KENNEDY

N.E.L.A. Commercial National Section Chairman
Vice-President and General Manager
Ohio Public Service Company

IT IS ONLY of very recent years that the customer aspect of our industry has been receiving the attention it deserves.* In my opinion this fact is unfortunate. I believe proper commercial initiative in the early days of our industry would have prevented much of the existing lack of public understanding and would have placed us in a position where political attacks such as are now being made would have been impossible.

Consider the method of charging for electric service. With rate schedules based on rate per kilowatt-hour it is only natural that our customers should look upon electricity as a commodity, whereas, as we know, it can equitably be sold and charged for only as a service. As we look back over the past forty years it seems to me that the development of the watt-hour meter was perhaps the most unfortunate happening in the history of the industry.

With the actual variable cost of energy used by the average domestic customer constituting less than 10 per cent of the total cost of service the adoption of a rate policy based on measurement of kilowatt-hours certainly evidences a total lack of commercial judgment.

Being a regulated monopoly business, it is to be expected that customers should judge rates on cost of service to us rather than on value to them. Our industry has only itself to blame for the fact that the public finds it difficult to understand the preponderance of fixed charges in the cost of electric service supply. Admitting that we delayed too long in correcting this mistake in the method of charging, it is the obligation of our commercial departments to promote the adoption of a more equitable type of rate.

**Excerpts from Mr. Kennedy's recent address before the Middle West division, N.E.L.A.*

Utility Merchandising Achievements and Policies —1930

WHAT were the real merchandising achievements of utilities during 1930? What values did their merchandise sales and energy revenues per domestic customer attain, and how did they compare with 1929? What methods and policies did they employ, and how much did it cost to secure this business?

These general questions have arisen many times and have been answered generally before, but a more detailed analysis was needed to make clear the lessons to be learned. Through the co-operation of about 100 utility companies serving about 6,500,000 domestic customers we have been able to compile information which represents an analysis of nearly 48,200 items and to present these findings in 13 tables and 28 charts, from which the results may be visualized.

Obviously it is impracticable to present 48,200 items in a form that can be readily assimilated, so the information has been boiled down to regional figures. The comments associated with each set of graphs and tables should enable any reader to grasp quickly the significant facts, but the greatest value will come from comparing achievements with corresponding practices.

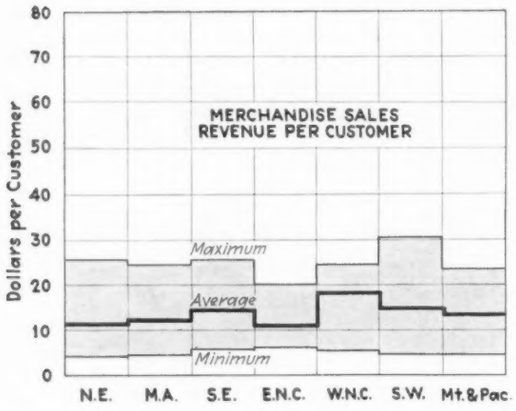
Attention is called to the data compiled on merchandise revenue and what it costs, comparisons of energy consumption per customer, the relative magnitudes of energy and merchandise revenue, the number of customers per field salesmen and per store, the comparisons of heavy-duty appliance sales in 1930 and 1929, practices affecting trade relations, the allocation of sales expenses, payment of salesmen, duration of campaign periods, price policies and costs of installation, saturation of appliances, installment payment and servicing policies, purchasing channels and discounts, how energy consumption and revenues per device compare, and achievements in selling smaller appliances.

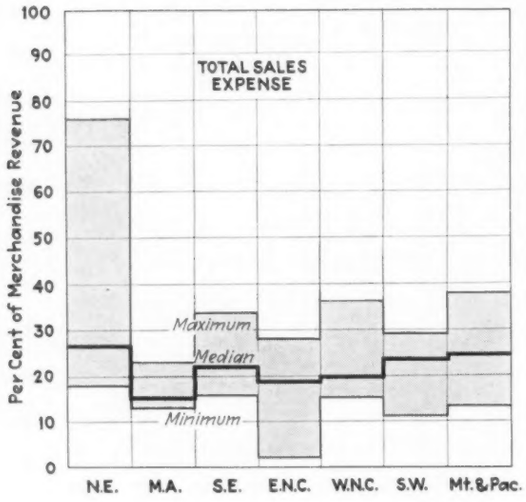
Since the accompanying tables and charts were prepared reports have been received from four additional companies serving 2,250,000 domestic customers. These swell the coverage to 8,750,000 domestic-energy customers, or 44 per cent of all in the United States, and increase the merchandise revenue reported to $55,500,000.

In studying regional and national figures it should be remembered that no adjustments have been made for companies which did not report, so the figures should not be considered as true regional or national totals. However, with a few exceptions, reports were received from the most representative companies.

Readers are cautioned not to estimate regional or national totals on the basis of customers covered, because there is no assurance that the unreported companies achieved the same average results. They may have done better and they may not have done so well.

Merchandise Revenue and What It Costs

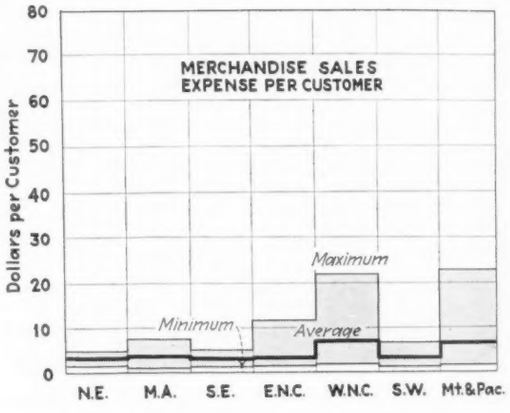




The merchandise sales revenue per customer is relatively uniform throughout the United States, reaching its sectional peak in the West North Central States ($18 per customer) and attaining a record high ($31) for an individual company in the Southwest.

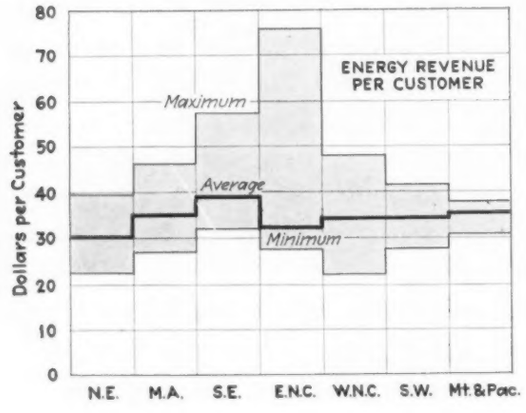
To secure this business a fairly uniform sales expenditure per customer has been made, the district with the highest section revenue average spending the maximum ($7) per customer, although the Mountain and Pacific States spend a similar amount, but with less results. The corresponding maximum revenue ($31) and sales expense ($7) in the Southwest are rather remarkable, but may be due to aggressive sales effort in a relatively untouched field.

For low ratio of sales expense to merchandise revenues the Middle Atlantic section holds the section record, although one company in the East North Central zone has a lower individual ratio. New England shows by its ratio the highest degree of sales expenditures, as a section or for individual company, but its sales revenue per customer is relatively low as a section and about average comparing the best reports.

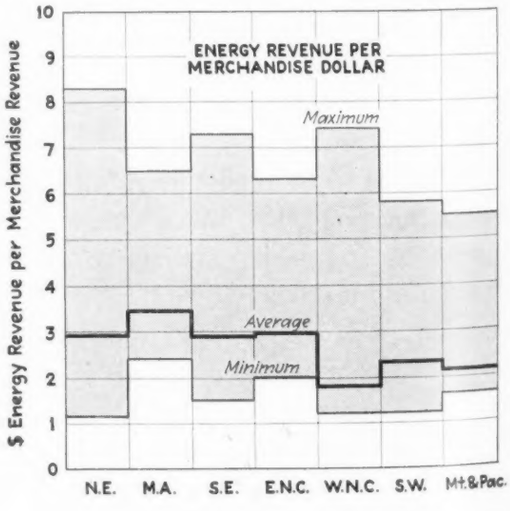


Is Energy or Merchandise Revenue More Important?

Energy revenue per customer ranges from $30 to $39, comparing section averages, the peak being attained in the Southeast, but considering individual system achievements the maximum ranges from $37.50 to $75, attained in the East North Central States.



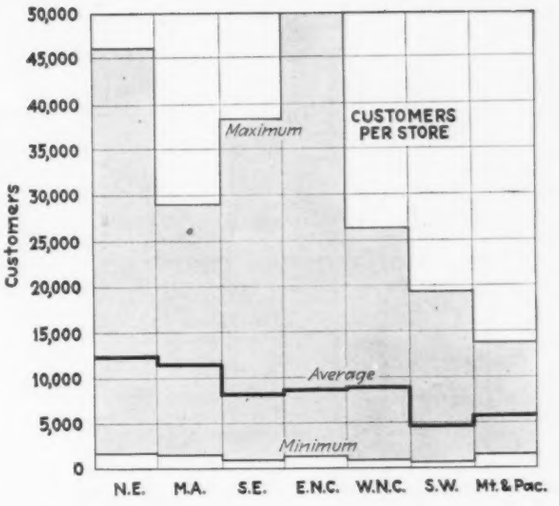
The average section energy revenue per merchandise dollar ranges from $3½ in the Middle Atlantic States to $1.8 in the West North Central. It is interesting to observe that the West has a lower ratio of energy revenue to merchandise revenue than the East, due partly to the higher merchandise revenue per customer. Note the wide departures of maximum ratio from the sectional averages, particularly in New England (8⅜), the Southeast (7⅛) and West North Central States (7½).

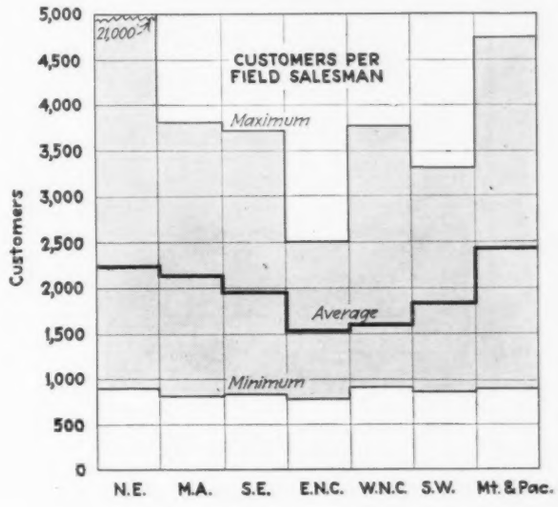


How Many Customers Should a Salesman and Store Serve?

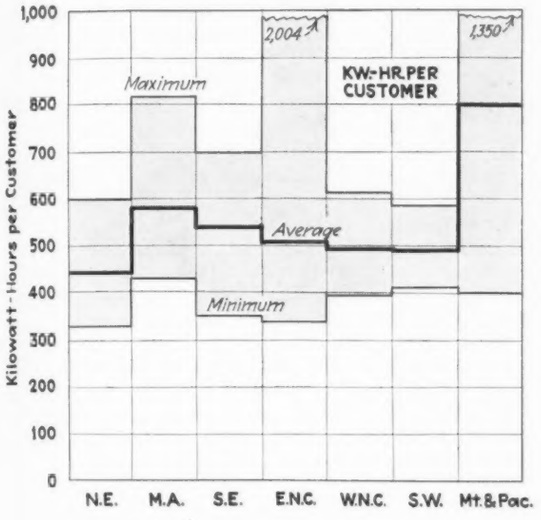
Judging from sectional averages, 1,500 to 2,400 customers should be the extent of a salesman's scope and 5,000 to 12,500 customers the extent of a store's influence. But wide variations from these averages are shown by individual companies. Apparently, however, there is considerable uniformity of practice in the maximum degree of concentration of salesmen, as the minimum customers per salesman hovers around 800-900.

Obviously, the less customers a salesman has to contact the more intimate and thorough can be his work. On the other hand, an individual salesman cannot do a very good job when his clientele is composed of 21,000 customers. A comparison of the salesman concentration with the sales results requires a study of the individual companies' records.





Kw.-Hr. per Domestic Customer Show Wide Diversity



The Mountain and Pacific section stands out above all other parts of the United States for energy usage per domestic customer (800 kw.-hr.) and one of its companies reports about 1,350 kw.-hr. But for an individual system, that in the East North Central section, with a record of 2,004 kw.-hr., is preeminent in the group reporting. The upper envelope of the shaded area shows the maximum of achievement so far reported.

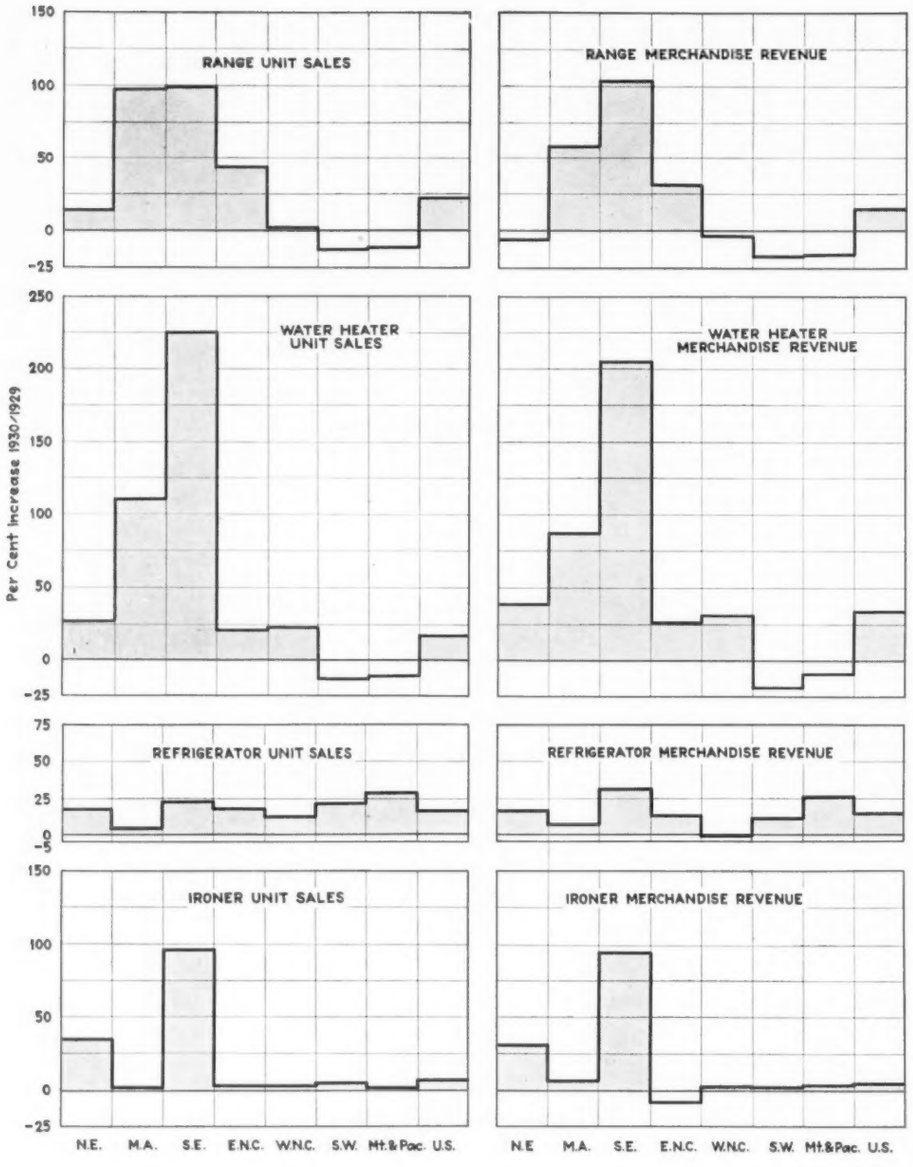
Utility Practices Affecting Trade Relations

Figures in "Yes" and "No" columns indicate number of companies reporting.

	N.E.		M.A.		S.E.		E.N.C.		W.N.C.		S.W.		Mt.&Pac.		U.S.	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Contractors engaged to install ranges and water heaters	12	3	6	2	11	0	12	2	8	3	9	1	5	2	**63**	**13**
Pay contractor cost and profit	4	1	2	1	6	2	8	0	4	0	6	3	3	1	**23**	**8**
Pay contractor flat rate	7	0	5	1	6	0	8	1	4	0	5	3	3	2	**38**	**7**
Installation costs charged on bills	6	5	6	2	8	3	9	3	10	0	4	2	6	2	**49**	**17**
Carry installment accounts for dealers	2	11	4	5	1	9	6	8	6	0	3	6	1	7	**23**	**46**
Carry installment accounts on same terms as utility sales	2	3	4	1	1	1	3	3	6	0	2	3	1	3	**19**	**14**
Dealers are financially able to participate in utility special term campaigns	9	3	6	1	3	4	12	3	5	4	7	3	6	0	**48**	**18**
Dealers given discount if purchase from utility stock	13	1	7	1	9	1	13	2	9	1	7	2	4	0	**62**	**8**
Marked success in decreasing inadequate wiring	9	3	7	2	9	1	..	..	5	3	6	3	7	..	**43**	**12**
Bonus to dealers on sales, based on energy revenue	0	10	0	4	0	9	0	7	0	4	0	9	0	6	**0**	**49**
Commissions to dealers for sales:																
Number of companies reporting	7	5	4	3	3	8	5	8	2	6	1	8	3	4	**25**	**42**
Maximum, per cent	25		20		25		10		20		15		20		**25**	
Minimum per cent	10		10		5		10		10		10		10		**5**	
Median, per cent	15		12.50		10		10		12		..		13		**12.25**	

Practices differ greatly, but it is interesting to observe from the accompanying table that, of the companies reporting, 83 per cent engage contractors for installation work, 80 per cent pay them cost plus profit, 78 per cent carry installation costs on electric bills, 33⅓ per cent carry dealers' accounts, 89 per cent give dealers discount on purchases from utility stock, but no companies pay dealers a sales bonus based on energy revenue.

Fifty-three per cent of the companies report that they pay dealers a commission on sales, the maximum being 25 per cent, the minimum 5 per cent, and the median about 12¼ per cent.



Boom-Year Sales Exceeded in Most Sections

Although 1930 has been referred to as a depression year, utility merchandising achievements shown do not seem to justify this comment except in a few cases. Most striking are the increases in sales of electric water heaters, ranges and ironers in the Southeast, where 90 to 225 per cent increases over 1929 figures were attained. The Middle Atlantic section reports 95 to 110 per cent increases in ranges and water heaters respectively. New England shows a 30 per cent increase in ironer sales. Refrigerator sales increased 12 to 30 per cent in all sections except the Middle Atlantic States.

The unit sales and merchandise revenue curves do not correspond in some sections, but can be accounted for by a change in the unit prices at which the equipment was sold. In some cases the average unit price has been lower and in other cases it has been higher, due, evidently, to selling a higher grade of merchandise. It is significant that four record achievements were obtained with a reduced unit price, but two records were attained with the same or higher unit prices than in 1929.

Range and Water Heater Price Practice and Costs of Installation

Price practices differ around the United States, but 90 per cent of the companies reporting include installation expense in advertised price, 35 per cent absorb the installation expense (14 per cent charging to capital cost, 57 per cent to sales expense) and 33⅓ per cent extend absorption of installation expense to dealer sales. Eighty-four per cent of the utilities sell at list price. The maximum cost reported for installing ranges is $75 and the average $35. The installation prices for water heaters—$55 (max.) and $24 (median) are evidently due to prorating the expense of range-water heater installations because a house wired for a range needs little additional wiring for a water heater and installations usually occur in that order or jointly.

Figures in "Yes" and "No" columns indicate number of companies reporting information.

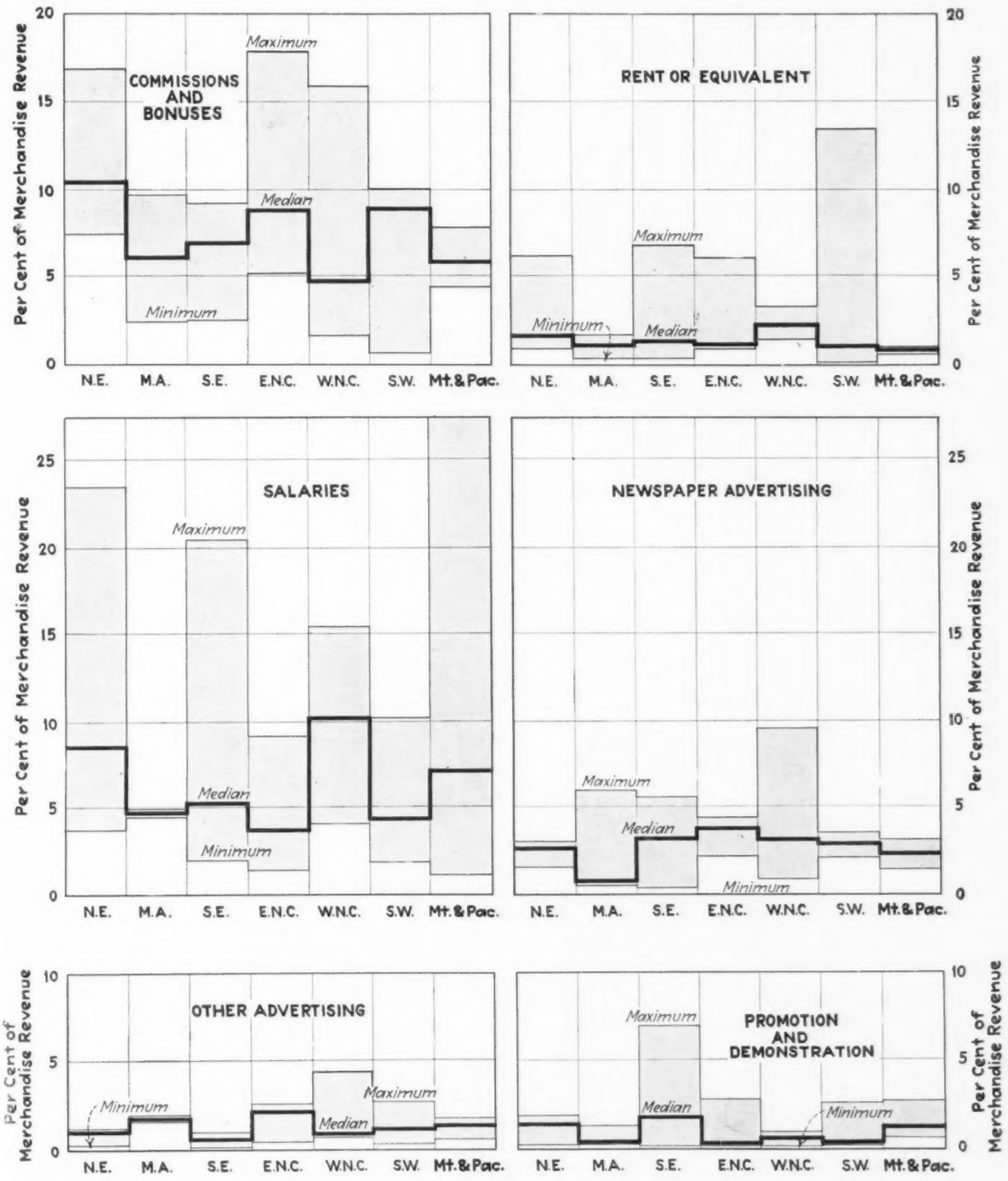
	N.E.		M.A.		S.E.		E.N.C.		W.N.C.		S.W.		Mt.& Pac.		U.S.	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Advertised prices include installation	13	1	7	2	9	1	13	..	11	1	10	1	6	2	69	8
Installation Cost:																
Absorbed by utility	12	8	..	13	2	10	8	9	..	13	5	13	6	9	39	74
Charged to capital cost	5	7	..	7	..	6	2	7	1	8	..	9	..	7	8	51
Charged to sales expense	7	1	..	6	2	4	6	2	5	5	5	4	6	1	31	23
Utility absorption of installation extended to dealer sales	6	5	..	5	1	5	5	4	3	5	..	6	1	2	16	32
Sell at list	11	1	9	0	11	0	14	0	*11	0	0	11	7	0	63	12
Cost of installing ranges, dollars:																
Maximum	75		58		60		50		48.50		45		60		75	
Minimum	40		7.50		30		20		18.50		17		3.75		3.75	
Median	57.50		42.50		37.50		30		30		30		35		35	
Cost of installing water heaters, dollars:																
Maximum	55		40		50		35		40		35		45		55	
Minimum	20		3		10		20		12		5		6		3	
Median	31		23		29		27.50		24		20		15		24	

*One company sells water heaters at cut prices.

Allocation of Sales Expenditures

Commissions and bonuses constitute the major single outlet for sales expense, ranging from 4 to 11 per cent (section average). New England reports the highest average, but the East North Central section shows the highest company percentage. Salaries rank next in magnitude, ranging from 3 to 10 per cent (section average), with the highest section average in the West North Central and the highest company percentage in the far West. Newspaper advertising ranges from 1 to 3 per cent (section average), the East North Central States having the highest section average and the West North Central the highest company percentage. Other advertising adds another 1 to 2 per cent, the highest section figure being reported by the East North Central States and the maximum company percentage by a West North Central company.

It will be observed that New England and the North Central States show the highest appreciation of the value of these expenditures.



Summary of Utility Merchandising Achievements

Based on the reports of 85 companies serving about 6,500,000 domestic customers, nearly $31,000,000 worth of ranges, water heaters, refrigerators and oil burners were sold by these utilities in 1930, compared with $27,000,000 in the boom year of 1929, or an increase of 14.5 per cent. Some companies did not report on all devices.

Refrigerators stand out for both number of units and dollars sold—79,200 at $21,000,000, or an increase of 16 and 14 per cent respectively. More than eleven of these units were sold in 1930 per 1,000 customers served, and the estimated annual consumption and energy revenue from these sales are respectively 57,540,000 kw.-hr. and $2,500,000.

Ranges rank next in number of units and dollars sold—57,200 to $8,355,000, or an increase of 23 per cent and 15 per cent respectively over 1929. More than eight units were sold per 1,000 customers served, and the estimated annual consumption and energy revenue are respectively 100,270,000 kw.-hr. and $3,100,000.

Water heaters and ironers were runners-up, totaling 19,800 units at $1,630,000. There was an increase of 18 per cent and 7.7 per cent in number of water heaters and ironers sold and the dollar value increased 34 and 3.5 per cent respectively.

Oil burner sales were reported by only a few companies, the West North Central section being most active on this application. Apparently the work is being left to other agencies, as decreases of 50 and 41 per cent in number of units and dollar value are indicated.

While the U. S. average price per unit at which all these devices, except oil burners and water heaters, were sold, decreased below 1929, it will be observed that some companies increased the quality sold, judging from increases in regional unit prices. The average rate per kilowatt-hour for these devices varies, but the United States averages range between 2.3 and 4.3 cents except for oil burners.

Reference should be made to the charts for further analyses.

NOTE—The figures in the column headed "Number of Companies" show how many gave data of the particular item of merchandise.

Region	Number of Companies	Unit Sales 1929	Value $ 1929	Unit Sales 1930	Value $ 1930	Kw.-Hr. 1930	Energy $ 1930	Average Appliance Price 1929	Average Appliance Price 1930	Av. Rate 1930 Cents Kw.-Hr.	Appliances Sold In 1930 Per 1,000 Customers.	Per Cent Increase 1929-1930 Units	Per Cent Increase 1929-1930 $ Value
Ranges—													
N.E.	15	4,155	642,278	4,719	597,411	6,923,100	232,300	154	126	3.86	4.96	+13.5	— 7.0
M.A.	10	3,132	565,973	6,182	897,991	15,930,500	266,915	181	145	1.68	3.84	+97.2	+58.6
S.E.	11	6,815	1,038,741	13,621	2,095,113	23,384,500	768,742	152	154	3.29	14.0	+99.8	+103.0
E.N.C.	15	6,510	956,998	9,383	1,358,544	15,617,020	658,822	147	134	4.23	5.34	+44.1	+42.0
W.N.C.	13	4,305	654,500	4,349	629,456	7,085,020	268,185	125	145	3.79	11.2	+ 1.02	— 3.8
S.W.	11	4,118	555,860	3,586	460,299	5,637,450	228,987	135	128	4.07	7.0	—12.9	—17.2
Mt.& Pac.	10	17,418	2,758,041	15,347	2,315,859	25,690,500	660,980	158	151	2.57	20.4	—11.9	—16.0
U.S.	**85**	**46,453**	**7,172,391**	**57,187**	**8,354,673**	**100,268,090**	**3,084,931**	**152**	**144**	**3.08**	**8.25**	**+23.0**	**+16.5**
Water Heaters—													
N.E.	13	737	86,637	940	120,280	4,564,850	86,135	117	127	1.85	0.99	+27.6	+38.8
M.A.	9	267	40,183	563	75,179	1,754,400	36,328	150	133	2.07	0.35	+111.0	+87.2
S.E.	10	609	79,700	1,981	243,900	6,150,920	200,643	101	134	3.25	2.04	+225.0	+205.0
E.N.C.	12	591	30,823	712	63,885	1,604,850	64,835	86	88	4.05	0.40	+20.5	+25.7
W.N.C.	11	175	15,503	216	20,312	488,353	14,430	88	94	2.95	0.55	+23.4	+31.0
S.W.	11	583	65,163	511	52,568	912,790	31,375	111	103	3.33	0.99	—12.3	—19.3
Mt.& Pac.	10	5,039	278,903	4,530	251,557	12,660,200	212,700	55	55	1.68	6.03	—10.1	— 9.8
U.S.	**76**	**8,001**	**616,911**	**9,453**	**827,681**	**28,136,363**	**646,446**	**75**	**90**	**2.30**	**1.36**	**+18.1**	**+34.1**
Refrigerators—													
N.E.	14	7,215	1,873,880	8,487	2,174,753	5,958,400	286,719	259	256	4.80	8.93	+17.6	+16.0
M.A.	10	17,686	4,514,934	18,441	4,799,401	14,396,950	438,694	255	261	3.05	11.4	+ 4.3	+ 6.3
S.E.	11	12,151	3,105,551	15,060	4,069,928	11,720,000	474,293	255	271	4.05	15.5	+23.9	+31.0
E.N.C.	15	13,287	3,575,149	15,666	4,027,122	10,758,139	533,661	270	257	4.95	8.9	+17.9	+12.6
W.N.C.	13	5,780	1,625,434	6,452	1,612,410	4,378,900	281,932	282	250	6.45	16.6	+11.6	— 0.8
S.W.	11	7,290	2,326,827	8,848	2,576,232	6,474,245	329,331	319	291	5.10	17.3	+21.1	+10.7
Mt.& Pac.	9	4,857	1,353,250	6,250	1,696,994	3,850,100	142,999	278	272	3.72	8.32	+29.0	+25.4
U.S.	**83**	**68,266**	**18,375,025**	**79,204**	**20,956,840**	**57,536,734**	**2,487,629**	**269**	**265**	**4.33**	**11.4**	**+16.0**	**+14.0**
Ironers—													
N.E.	14	916	78,447	1,240	102,695	286,428	14,662	85	86	5.12	1.31	+35.4	+30.8
M.A.	10	2,730	208,349	2,790	219,526	820,125	30,218	76	78	3.68	1.73	+ 2.2	+ 5.4
S.E.	10	171	12,558	338	24,473	121,285	4,200	73	72	3.47	.34	+97.8	+94.7
E.N.C.	15	2,704	262,377	2,794	237,695	493,866	30,451	97	85	6.17	1.58	+ 3.3	— 9.4
W.N.C.	13	1,000	71,736	1,034	73,130	258,346	9,850	71	70	3.82	2.66	+ 3.4	+ 1.9
S.W.	11	680	43,459	716	43,961	266,460	12,548	63	61	4.70	1.39	+ 5.3	+ 1.2
Mt.& Pac.	8	1,407	100,314	1,431	102,799	179,972	14,280	71	71	7.92	1.90	+ 1.7	+ 2.5
U.S.	**81**	**9,608**	**777,240**	**10,343**	**804,279**	**2,426,482**	**116,209**	**81**	**78**	**4.77**	**1.48**	**+ 7.65**	**+ 3.48**
Oil Burners—													
N.E.	1	.....	.....			300	18	....	....	6.0	....	.....	.....
M.A.	1	4	1,911	1	550	120	9	470	550	7.5	....	—75.0	—71.1
E.N.C.	1	17	9,000	4	2,400	800	48	530	600	6.0	....	—76.5	—73.3
W.N.C.	1	50	25,237	35	18,310	.....	.....	427	523	...	....	—42.9	—27.5
U.S.	**4**	**80**	**36,148**	**40**	**21,260**	**1,220**	**75**	**451**	**530**	**6.15**	....	**—50.0**	**—41.0**
Grand total for U.S.		**132,408**	**26,977,715**	**156,227**	**30,964,733**	**188,368,889**	**6,335,290**	...	...	**3.37**	**19.1**	**+18.0**	**+14.3**

Per Cent Saturation of Major Appliances

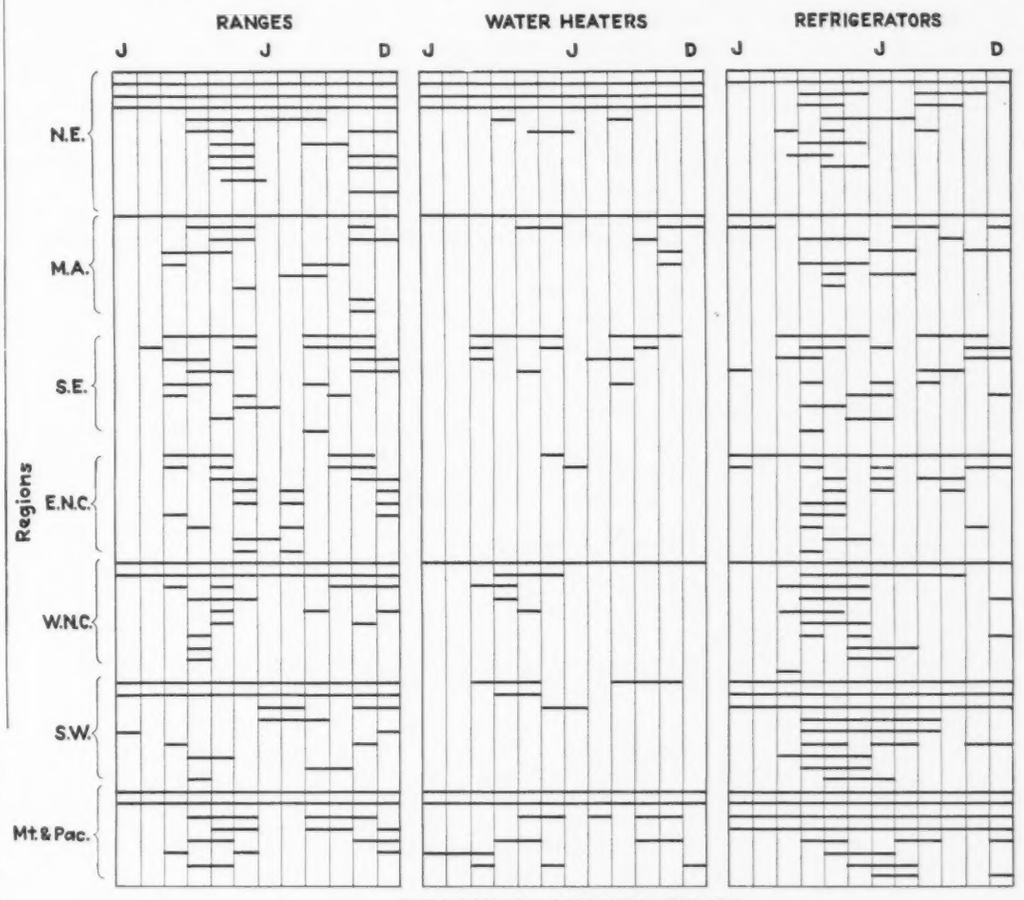
Covers only the number of companies indicated

Region →	N.E. 100	M.A. 200	S.E. 300	E.N.C. 400	W.N.C. 500	S.W. 600	Mt. & Pac. 700	U.S.
Ranges								
No. of companies reporting	5	5	7	5	6	6	6	**40**
Saturation max. per cent	6	5	10	10	16	11	40	**40**
Median, per cent.....	3	2	6	6	5	2.3	24	**5**
Water Heaters—								
No. of companies reporting	2	3	6	2	3	4	6	**26**
Saturation max. per cent	5	1	2	1	2	2	13	**13**
Median, per cent.....	3.5	0.5	1	0.5	1.5	1	4.5	**1**

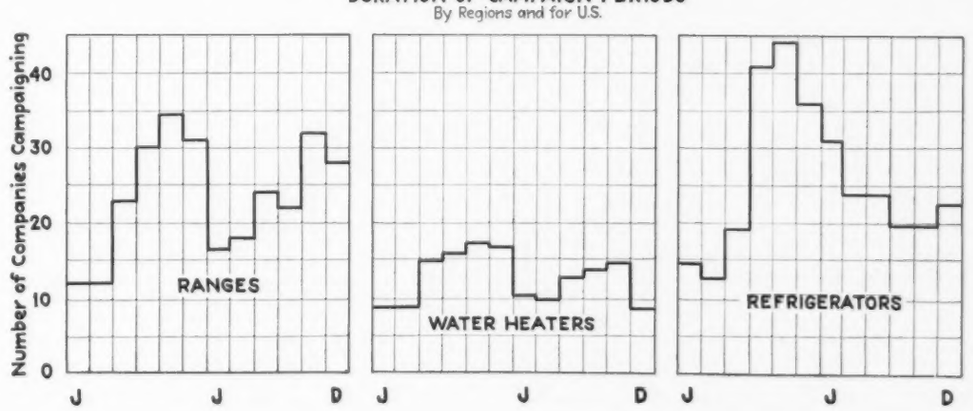
Region →	N.E. 100	M.A. 200	S.E. 300	E.N.C. 400	W.N.C. 500	S.W. 600	Mt. & Pac. 700	U.S.
Refrigerators—								
No. of companies reporting	4	3	5	7	7	6	7	**39**
Saturation max. per cent	13	11.2	12	16	25	14	15	**25**
Median, per cent.....	10	10	12	13	15	12	11	**12**
Ironers—								
No. of companies reporting	3	4	3	5	5	5	4	**29**
Saturation max. per cent	3	15	4	15	10	5	8	**15**
Median, per cent.....	2	1.9	2	5	5	1.5	4	**2**

Relatively few companies (26 to 40) were able to give the saturation of different devices in their territories, but the few figures given are interesting. For example, 40 per cent is the maximum saturation reported for ranges; this occurred on a Mountain-Pacific property. The next best range saturation, 16 per cent, is on a West North Central system. A far West company reports the highest water heater saturation—13 per cent. Saturation of refrigerators is uniformly high—about 12 per cent—and a value of 25 per cent was reported by a West North Central property. Ironers have 15 per cent saturation on two properties, one in the Middle Atlantic, the other in the East North Central States.

Campaign Periods Range from One to Twelve Months



DURATION OF CAMPAIGN PERIODS
By Regions and for U.S.



Only 32 per cent of the companies reporting campaign periods on ranges continue their efforts throughout the year. Nearly half push water heaters uniformly, and 27 per cent do so on refrigerators.

If the efforts of the companies reporting duration of campaigns were consolidated, the national effort would look like the charts at the bottom, where campaigning on ranges and water heaters builds up to peaks in May and November and refrigerators receive their maximum backing in May.

Salary Plus Commission Favored for Compensating Salesmen

Payment of field salesmen ranges from $1,200 to $3,000 a year and that of store salesmen from $900 to $2,700 a year. East North Central, New England, West North Central and Southwest companies rank in the order named for payment of store salesmen, whereas Middle Atlantic, New England and West North Central companies rank highest for payment of field salesmen. The average salaries for field and store salesmen are $2,000 and $1,500 per year.

Flat salaries alone are not very popular, as only 6.4 per cent report their use, and in these cases $2,600 and $1,200 are the maximum and minimum salaries reported. Neither are commissions, alone, popular, as only 18 per cent report their use with a maximum commission of 18 per cent and a minimum of 9 per cent. Salaries plus commissions are reported by 73 per cent of the companies and they range from $3,600 plus 10 per cent and $1,980 plus 20 per cent down to $300 plus 5 to 10 per cent and $1,200 plus 2 per cent.

Bonuses on estimated energy revenue have not become as popular as they merit considering the fact that energy consumption is just as important as merchandise revenue. Only 2 per cent report bonuses ranging from $1 per kilowatt connected to $1, $2 and $4, respectively, for each refrigerator, range and water heater.

Variety of Practices Regarding Salaries, Commissions and Bonuses

Region ⟶	N.E.	M.A.	S.E.	E.N.C.	W.N.C.	S.W.	Mt. and Pac.	U. S.
Annual income of store salesmen (average dollars)—								
Maximum	2,200	1,800	1,920	2,700	2,100	2,100	1,900	2,700
Minimum	1,000	1,000	1,200	1,000	900	900	1,200	900
Median	1,500	1,200	1,800	1,500	1,500	1,500	1,650	1,500
Annual income of field salesmen (average dollars)—								
Maximum	2,800	3,000	2,400	2,640	2,700	2,000	2,580	3,000
Minimum	1,500	1,500	1,560	1,500	1,500	1,200	2,040	1,200
Median	2,300	1,800	2,010	1,950	2,000	1,800	2,400	2,000
Flat salary only (average)								
Companies reporting—yes	1	0	0	0	1	3	0	5
Companies reporting—no	13	8	9	15	12	8	8	73
Maximum dollars	2,600	....	....	....	2,400	2,100	....	2,600
Minimum dollars	....	....	....	....	....	1,200	....	1,200
Median	....	....	....	....	....	1,800	....	....
Commission only—								
Companies reporting—yes	5	1	0	3	3	1	1	14
Companies reporting—no	9	7	9	12	10	10	7	63
Maximum per cent	15	10	..	18	12	10	10†	18
Minimum per cent	10	..	..	10	10	..	9†	9
Median per cent	10	..	..	10	..	..	..	..
Salary + Commission								
Companies reporting—yes	8	6	9	12	8	7	7	57
Companies reporting—no	6	2	0	3	5	4	1	21
Maximum dollars and per cent (annual)	2,340+15	2,080+small commission	2,300+5	3,300+5 and 7½	3,600+10	2,100+10	2,100+10-12	3,600+10
	2,340+15	900+10	600+10	900+20	1,500+15	1,980+20	1,800+‡15	1,980+20
Minimum dollars and per cent (annual)	720+6* and 10	600+10	300+5-10	600+8-10-12	600+6-14	300+10	4,800+8-12	300+5-10
	1,375+5	1,200+2	900+5	600-1,800 +4	1,200+5	1,500-2,100 +5	1,200+¶5	1,200+2
Bonus on estimated energy revenue—								
Companies reporting—yes	3	2	5	1	3	1	1	16
Companies reporting—no	11	8	4	14	10	10	7	64
Bases of bonus	2% sales volume per	$1 per kw. connected.	Flat bonus 5% on sales above first $2,000 sales 1 cent per kw.-hr.	8½% increase Domestic Revenue 4% commercial and flat rate revenue.	$1 per kw.		Ranges $2 Refrigerators $1 Water heaters $4	
	1 cent kw.-hr.							
Salary or commission + bonus—								
Companies reporting—yes	0s	1s	..	..	1c	..	..	..
Companies reporting—no	14s	7s	..	..	12c	..	..	..

s Salary only and bonus.
c 2 per cent commission only and bonus.
* 6 per cent on first $1,000 per month.
10 per cent on balance of monthly sales.

† 9 per cent on time payments; 10 per cent on cash sales.
‡ 5 per cent first six sales per month.
10 per cent next two sales per month.
15 per cent for each one over first eight sales on refrigerators only.

Installment Payment Practices

Region ——→	N.E.	M.A.	S.E.	E.N.C.	W.N.C.	S.W.	Mt. & Pac	U. S
RANGES—								
Per Cent Down (In parentheses followed by number of companies reporting)	(10)-11 (4 to 10½)-3	(10)-8 (9⅓)-1 (5)-1	(10)-8 (2½ to 20)-3	(10)-12 (5)-1	(10)-7 (5)-2 (25)-1	(10)-10 (5 to 10)-1	(10)-6 (5)-1 (3)-1	**(10)-52** **(5)-5** **(2½ to 25)-10**
Time to Pay (Months in parentheses followed by number of companies reporting)	(18)-5 (12)-3 (10 to 24)-6	(18)-4 (10 to 24)-6	(18)-3 (12)-2 (3 to 24)-5	(18)-4 (10 to 30)-9	(24)-7 (12)-4 (12 to 18)-1	(18)-7 (12 to 24)-4	(18)-3 (12 to 24)-4	**(18)-26** **(12)-9** **(24-)7** **(3 to 30)-35**
WATER HEATERS—								
Per Cent Down (In parentheses followed by number of companies reporting	(10)-10 (5 to 10)-1 (5)-1	(10)-8 (5)-1	(10)-7 (2½ to 20)-3	(10)-10	(10)-6 (25)-1 (5)-1	(10)-11	(10)-6 (7½)-1 (5)-1	**(10)-58** **(5)-4** **(2½ to 25-6)**
Time to Pay (Months in parentheses followed by number of companies reporting)	(18)-3 (12)-3 (12 to 24)-5	(18)-4 (12 to 24)-5	(24)-3 (3 to 24)-6	(18)-3 (6 to 18)-7	(24)-5 (12)-2 (1 to 24)-3	(18)-6 (12)-3 (12 to 24)-2	(12)-4 (18)-3 (12 to 18)-1	**(18)-19** **(12)-12** **(24)-8** **(1 to 30)-29**
REFRIGERATORS —								
Per Cent Down (In parentheses followed by number of companies reporting)	(10)-10 (5)-2 (5 to 10%)-1	(10)-8 (5)-1 (4%-1)	(10)-8 (2½ to 20)-3	(10)-12 (5 to 10)-1	(10)-6 (25)-1 (5 to 10)-1	(10)-10 (20)-1	(10)-4 (5)-1 (1½ to 20)-3	**(10)-58** **(5)-4** **(1½ to 25)-12**
Time to Pay (Months in parentheses followed by number of companies reporting).	(12)-2 (18)-2 (24)-2 (10 to 24)-7	(18)-4 (24)-3 (12 to 30)-3	(24)-5 (12)-2 (3 to 24)-3	(24)-5 (18)-4 (6 to 24)-5	(12)-4 (18)-3 (12 to 30)-4	(18)-4 (24)-2 (12 to 24)-5	(24)-3 (12)-2 (12 to 24)-3	**(24)-20** **(18)-17** **(12)-10** **(3-to 30)-30**
IRONERS—								
Per Cent Down (In parentheses followed by number of companies reporting)	(10)-13 (5)-1	(10)-8 (7.7)-1 (5)-1	(10)-7 (20)-1 (10 to 20)-1	(10)-11 (15)-1 $1 down	(10)-6 (25)-1 (5)-1	(10)-10 (33⅓)-1	(10)-6 (5 to 6)-1 (5)-1	**(10)-61** **(5)-4** **($1 down to 33⅓%-8)**
Time to Pay (Months in parentheses followed by number of companies reporting)	(12)-7 (18)-2 (10 to 24)-4	(12)-5 (18)-3 (12 to 24)-2	(12)-8 (3 to 24)-1	(12)-7 (10)-3 (6 to 18)-4	(12)-6 (1 to 24)-4	(12)-4 (18)-3 (3 to 18)-4	(12)-4 (18)-3 (15)-1	**(12)-41** **(18)-11** **(1 to 24)-23**

Ten per cent down seems to be the popular maximum for installment payments according to the percentage of companies reporting this figure, although values as high as 20 to 33⅓ per cent are reported from the Southeast, West North Central and Pacific-Mountain sections. So far as time of payment is concerned, eighteen months is the most popular term for ranges and water heaters, twelve months for ironers and 24 months for refrigerators. Again, however, exceptions occur, and terms as long as 30 months are allowed by some companies on all except ironers.

Sales Facilities, Revenue and Expense

Among the companies reporting, there were 1,743 merchandise stores, 1,059 store salesmen, 3,424 field salesmen, 271 demonstrators, a total merchandise revenue of $49,127,000 and a total merchandise sales expense of $14,110,000. Apparent discrepancies may appear in the table when comparing these values with the charts due to the fact that the number of companies reporting each item differed slightly, whereas unit values were based on actual number of customers served. Explanation for the smaller number of store salesmen than stores may be found in the fact that many companies rotate field salesmen on the store floor, but do not rate them as store salesmen.

The unit values shown in charts give a better conception of the regional variations in these items.

Region	Total No. of Domestic Customers in Region	Total No. of Domestic Customers of Cos. Reporting in Region	Total Number of Stores	Total No. of Store Salesmen	Total No. of Field Salesmen	Number of Demonstrators	Total Merchandise Revenue	Total Merch. Sales Expense
New England	1,863,438	928,047	144	251	312	50	$4,782,010	$1,097,910
Middle Atlantic	5,832,934	1,610,331	212	245	753	60	8,021,337	2,484,325
South Atlantic and East South Central	2,192,946	455,331	264	57	304	20	5,937,336	1,203,974
East North Central	5,027,905	1,759,025	396	220	1,203	63	14,852,683	4,082,451
West North Central	1,965,472	388,175	157	66	190	7	3,870,402	1,526,519
West South Central	1,047,798	512,026	369	75	346	40	7,125,573	1,442,197
Mountain and Pacific	2,508,281	752,489	201	145	316	31	4,537,639	2,272,728
Totals	**20,438,774**	**6,405,424**	**1,743**	**1,059**	**3,424**	**271**	**49,126,980**	**14,110,101**

Achievements in Selling Smaller Domestic Appliances

Excluding ranges, water heaters, refrigerators, ironers, oil burners and other devices not listed, the companies reporting on the devices listed sold $21,168,000 worth in 1930, just slightly more than in the boom year 1929. More than 75 per cent allowed installment payments. The East and West North Central States report the highest proportion (39.6 per cent) of these $21,000,000 sales, but New England and the Middle Atlantic States are runners-up with 36.2 per cent.

Quite a different order of importance exists when sections are compared for percentage increase in merchandise revenue over 1929. The combined Southeast and Southwest sections over-

(Continued on next page)

(Note regions have been combined in this tabulation because of space limitations)

	Units Sold			Merchandise Revenue (Dollars)			Per Cent Saturation			Installment Payments Allowed	
	1929	1930	Per Cent Increase	1929	1930	Per Cent Increase	Max.	Min.	Median	Yes	No
Southeast and Southwest—											
Irons	49,475	53,948	+ 9	260,080	298,293	+ 15	98	60	90	15	4
Toasters	6,794	10,479	+ 54	46,615	69,391	+ 48	90	2	20	16	5
Percolaters	9,877	12,435	+ 26	92,815	119,632	+ 14	40	4	25	16	2
Waffle Irons	9,689	11,356	+ 18	97,973	115,329	+ 18	30	6	20	16	2
Floor Polishers	137	69	— 49	4,939	1,671	— 66	5	2	2.5	7	0
Vacuum Cleaners	8,223	8,463	+ 3	430,072	436,837	+ 2	75	5	40	21	0
Washers	7,266	7,764	+ 7	777,637	772,441	— 1	35	2	17.5	21	0
Fans (all)	14,209	19,301	+ 36	272,414	349,525	+ 24	60	0.5	25	22	1
Health Lamps	14	90	+543	649	4,189	+545	0.5	0.2	0.3	5	1
Incandescent Lamps	1,713,305	2,215,522	+ 29	436,045	629,304	+ 44	100	80	90	5	14
Floor and Table Lamps	6,053	12,766	+ 94	55,997	96,985	+ 70	80	2	62.5	7	4
Electric Clocks	133	1,902	+1330	2,550	21,070	+725	10	2	6	11	1
Radios	3,125	7,380	+136	336,151	604,036	+ 79	60	10	22	8	5
Total	**1,828,300**	**2,361,475**	**+ 29**	**2,857,266**	**3,702,052**	**+ 30**	....	.....	.....	**170**	**39**
New England and Middle Atlantic—											
Irons	105,385	99,309	— 6	579,946	566,956	— 2	97	0.3	85	20	5
Toasters	30,115	28,362	— 6	194,622	174,628	— 10	54	0.2	40	18	6
Percolaters	17,260	17,089	.....	151,322	142,720	— 2	35	.006	26.7	17	7
Waffle Irons	16,699	18,432	+ 9	157,211	161,726	+ 3	28	.08	15	17	7
Floor Polishers	437	648	+ 48	34,029	46,829	+ 38	5	.....	.....	5	3
Vacuum Cleaners	27,548	25,316	— 8	1,522,321	1,252,968	— 17	71	.07	25.1	22	2
Washers	25,883	28,209	+ 9	2,859,602	3,726,063	+ 30	55	.012	18	22	2
Fans (all)	7,047	5,687	— 19	129,372	89,216	— 31	23	.003	8.5	16	6
Health Lamps	130	366	+182	4,420	7,019	+ 58	5	.0009	.055	11	3
Incandescent Lamps	3,334,312	3,301,871	.....	727,220	722,108	— 1	90	.....	.....	3	14
Floor and Table Lamps	20,155	17,104	— 15	238,322	166,476	— 30	100	.03	50	19	9
Electric Clocks	1,640	7,100	+333	25,761	84,092	+226	15	1	8	8	4
Radios	2,376	5,537	+133	294,153	591,123	+101	75	.....	.....	8	2
Total	**3,588,987**	**3,555,030**	**— 1**	**6,918,301**	**7,731,924**	**+ 10**	....	.....	.....	**186**	**70**
East and West North Central —											
Irons	107,513	103,660	— 4	311,146	291,133	— 15	100	90	95	22	4
Toasters	34,704	29,898	— 14	195,387	183,338	— 6	80	10	40	21	6
Percolaters	16,989	16,706	— 1	176,178	158,019	— 10	90	3	30	18	7
Waffle Irons	22,647	24,153	+ 11	240,848	226,811	— 6	60	3	18	19	6
Floor Polishers	415	401	— 3	5,928	6,317	+ 7	10	.02	.05	5	3
Vacuum Cleaners	38,782	30,483	— 21	1,716,890	1,386,036	— 19	88	25	65	24	4
Washers	26,878	22,606	— 16	2,938,229	2,244,469	— 24	90	30	54	21	6
Fans (all)	9,610	13,256	+ 38	161,289	163,846	+ 2	60	0.5	15	31	12
Health Lamps	3,398	1,398	— 59	390,914	81,251	— 75	5	0.5	1	18	4
Incandescent Lamps	2,715,279	2,242,211	— 17	902,397	889,201	— 1	....	.....	.....	16	6
Floor and Table Lamps	32,978	25,380	— 23	543,424	478,810	— 12	100	30	82.5	23	8
Electric Clocks	4,360	17,196	+294	61,379	204,498	+236	20	1	2	11	4
Radios	19,268	20,788	+ 8	2,223,573	2,146,659	— 3	90	20	64	17	4
Total	**3,032,821**	**2,548,137**	**— 16**	**9,867,582**	**8,462,388**	**— 14**	....	.....	.....	**246**	**74**
Mountain and Pacific—											
Irons	17,110	17,449	+ 2	56,521	58,782	+ 3	103*	10	100	8	3
Toasters	9,522	8,211	— 7	63,862	51,188	— 19	80	5	58	6	5
Percolaters	4,729	3,451	— 27	50,471	36,447	— 28	75	4	42	8	3
Waffle Irons	9,901	5,856	— 41	100,213	55,480	— 44	70	2	34	8	3
Floor Polishers	166	256	+54	2,158	3,991	+ 85	2	1	1	5	0
Vacuum Cleaners	5,039	5,048	.....	268,259	265,640	— 1	75	4	50	11	0
Washers	6,441	5,522	— 14	702,822	579,542	— 18	65	15	45	10	0
Fans (all)	983	2,136	+117	19,327	16,949	— 12	40	0.5	2	8	3
Health Lamps	26,289	9,191	— 65	35,444	19,081	— 46	65	0.2	4	6	1
Incandescent Lamps	406,016	431,355	+ 2	120,189	113,695	— 5	....	.....	.....	7	3
Floor and Table Lamps	1,712	709	— 17	18,494	9,999	— 45	90	75	82.5	3	5
Electric Clocks	665	1,573	+136	11,408	32,179	+182	1	1	1	4	2
Radios	21	205	+876	2,969	28,859	+870	53	30	32.5	2	3
Total	**488,594**	**490,962**	**+ 0.4**	**1,452,137**	**1,271, 832**	**— 12**	....	.....	.....	**86**	**31**
Grand total merchandise figures of companies reporting for appliances listed											
Irons	279,483	274,366	— 2	1,207,693	1,215,164	— 1	103*	0.3	67.5	65	16
Toasters	81,135	76,950	— 5	500,486	478,545	— 4	90	0.2	80	61	22
Percolaters	48,855	49,681	+ 2	470,786	456,818	— 3	90	.006	57.5	59	19
Waffle Irons	58,936	59,797	+ 1	596,245	559,346	— 6	70	.08	45.5	60	18
Floor Polihers	1,155	1,374	+ 19	47,054	58,808	+ 25	10	.02	1.7	22	6
Vacuum Cleaners	79,592	69,310	— 13	3,937,542	3,341,481	— 15	88	.07	45.5	78	6
Washers	66,468	64,101	— 3	7,278,290	7,322,815	+ 1	90	.012	31.5	74	8
Fans (all)	31,849	40,380	+ 27	582,402	619,536	+ 6	60	.003	11.7	77	22
Health Lamps	29,831	11,045	— 64	431,427	111,540	— 74	5	.0009	.04	40	29
Incandescent Lamps	8,168,912	8,190,959	+0.2	2,185,851	2,354,308	+ 8	100	80	90	31	37
Floor and Table Lamps	60,898	55,960	— 8	856,237	752,270	— 12	100	0.03	77.5	52	26
Electric Clocks	6,798	27,771	+308	144,427	529,188	+266	20	1	4	34	11
Radios	24,790	33,910	+ 37	2,856,846	3,368,677	+ 18	75	10	48.2	35	14
Total	**8,938,702**	**8,956,604**	**— 0.2**	**21,095,286**	**21,168,196**	**+ 0.3**	....	.....	.....	..	..
Total merchandise revenue of companies reporting†					**49,126,980**						

*Indicates some customers have more than one device. †Includes ranges, water heaters, refrigerators, ironers and other devices not listed.

Servicing Practices

(Covers Only the Number of Companies Indicated)

L. = Life of unit. T.M. = Time and material. F. = Free.
G.P. = Manufacturers' guarantee period. M. = Material only. T.M.+ = Time and material plus profit.

Region ⟶	N.E.	M.A.	S.E.	E.N.C.	W.N.C.	S.W.	Mt. and Pac.	
RANGES—								**(12)-50**
Servicing Period (Months in parentheses, followed by number of companies reporting)	(12)-8	(12)-7	(12)-6	(12)-7	(12)-9	(12)-7	(12)-6	**G.P.-14**
	L.-4	....	G.P.-3	G.P.-3	G.P.-2	G.P.-2	G.P.-1	**L.-7**
	G.P.-2	G.P.-1	L.-1	L.-2	....	(3)-1	....	**(3)-1**
								T.M.-23
Basis of Charge (Number of companies reporting)	T.M.-6	F.-4	T.M.-3	T.M.-6	T.M.-2	T.M.-3	F.-4	**F.-12**
	M.-4	T.M.-3	M.-3	T.M.+-2	M.-2	M.-2	T.M.-2	**M.-11**
	F.-2	....	M.+20%-1	M.-1	F.-1	F.-1	M.-1	**T.M.+-2**
				$1/call-1	$1¼ 1 hr.-1		M.+10%-1	**Miscel.-4**
WATER HEATERS—								**(12)-45**
Servicing Period (Months in parentheses, followed by number of companies reporting)	(12)-9	(12)-6	(12)-6	(12)-6	(12)-5	(12)-7	(12)-6	**G.P.-11**
	L.-2	G.P.-1	G.P.-2	G.P.-2	G.P.-2	G.P.-2	G.P.-1	**L.-4**
	G.P.-1	....	....	L.-2	(12 to 24)-1	(3)-1		**(12 to 24)-1**
								(3)-1
Basis of Charge (Number of companies reporting)	T.M.-7	T.M.-3	T.M.-2	T.M.-3	T.M.-2	T.M.-3	F.-4	**T.M.-22**
	F.-2	F.-2	M.-2	T.M.+-2	M.-1	M.-2	T.M.-2	**F.-10**
	M.-1	....	M.+20%-1	F.-1	....	F.-1	M.-1	**M.-7**
				$1/call-1	$1¼ 1 hr.-1		M.+10%-1	**Miscel.-4**
REFRIGERATORS—	(12)-4			G.P.-5		(12)-4		**(12)-24**
Servicing Period (Months in parentheses followed by number of companies reporting)	G.P.-3	(12)-5	G.P.-3	(12)-2	(12)-5	(36)-2	(24)-2	**G.P.-18**
	L.-3	(36)-1	(36)-2	L.-2	G.P.-3	G.P.-2	(15)-2	**(36)-7**
	(36)-1	G.P.-1	(24)-2	(36)-1	(6)-1	(12 to 24)-1	G.P.-1	**(12 to 24)-7**
								L.-5
	(12 to 24)-1	....	(12)-2	(24)-1	....	(3)-1	....	**(3 to 6)-2**
Basis of Charge (Number of companies reporting)								**T.M.-19**
	T.M.-4	F.-4	M.-3	T.M.-6	T.M.-2	T.M.-3	F.-4	**F.-12**
	M.-3	T.M.-2	T.M.-2	T.M.+-2	M.-1	M.-1	M.+10%-1	**M.-9**
	F.-2	....	F.-1	M.-1	$1¼/hr.-1	F.-1	.....	**T.M.+-2**
			M.+20%-1	$1/call-1	....	....		**Miscel.-4**
IRONERS—								
Servicing Period (Months in parentheses followed by number of companies reporting)	(12)-8	(12)-7	(12)-5	(12)-6	(12)-4	(12)-7	(12)-4	**(12)-41**
	G.P.-2	G.P.-1	G.P.-3	G.P.-3	G.P.-3	G.P.-2	G.P.-1	**G.P.-15**
	L.-2	....	....	L.-2	(3)-1	(3)-1	....	**L.-4**
				3 Mo.-9				**(3)-3**
								T.M.-24
Basis of Charge (Number of companies reporting)	T.M.-6	F.-4	M.-3	T.M.-6	T.M.-3	T.M.-3	F.-3	**M.-9**
	M.-2	T.M.-3	T.M.-1	T.M.+-2	M.-1	M.-2	T.M.-2	**F.-9**
	F.-2	....	M.+20%-1	M.-1	$1¼/hr.-1	....	....	**T.M.+-2**
				$1/call-1				**Miscel-3**

Twelve months is the most popular servicing period reported for the devices, although many companies service the devices listed only for the manufacturer's guarantee period. The basis of charging for servicing is more varied. A time-and-material basis is the most popular on all these devices, although free servicing of ranges, water heaters and refrigerators is reported extensively, particularly in New England.

(Continued from preceding page)

shadow all others with a 30 per cent increase, approached only by the combined New England and Middle Atlantic sections with 10 per cent increase. The North Central and far West sections experienced respectively a 14 per cent and 12 per cent reduction in smaller merchandise revenue.

Considering the sections collectively, electric washers, radios, vacuum cleaners, incandescent lamps, irons, floor and table lamps contributed 87 per cent of the 1930 merchandise revenue from small appliances in the order named.

As might be expected, the highest saturations are reported for irons and incandescent, floor and table lamps, but 90 per cent is the record saturation reported for toasters, percolators and washers. Incandescent lamps, toasters, floor and table lamps, irons, percolators, radios, vacuum cleaners, waffle irons and washers rank in the order named for average saturation. The saturation of health lamps, floor polishers, electric clocks and fans is relatively low considering the regions collectively. However, there has been a marked increase in merchandise revenue from all devices except health lamps.

Examination of the individual sections presents a different picture. Considering the Southeast and Southwest, which had the biggest percentage increase in business, the following appliances stand out in the order named for percentage increase: Electric clocks, health lamps, radios, floor and table lamps, toasters, incandescent lamps and fans. In New England the merchandise revenue from the following devices increased in the order named: Clocks, radios, health lamps, floor polishers and washers.

Purchasing Channels and Discounts

Except in the case of water heaters, the majority of companies purchase heavy-duty devices through jobbers, although the margin in favor of jobbers is not so great in the case of ironers. Sixty per cent of the companies purchased water heaters direct from manufacturers. About 10 per cent of the companies purchasing from manufacturers do so through holding company contracts, whereas 35 per cent of the purchases from jobbers go through this channel. A few companies purchase through both manufacturers and jobbers.

Discounts from both manufacturers and jobbers were chiefly 40 per cent, whether purchased direct or through holding company, although a few reports of 50 per cent and discounts down to 10 per cent are given. The majority of companies buying refrigerators from jobbers report only 30 per cent discount, although some receive 40 per cent.

It will be observed in the explanatory notes on the tables that additional discounts (e.g., 5 and 2 per cent) above those given are allowed in a number of cases.

(Number of companies reporting these items is indicated)

In addition to discounts listed, thirteen companies receive discounts on balance; for example, 40 and 5 per cent, or 40 and 2 per cent. Three receive 5 per cent additional discount, two from manufacturers, one through holding company contract and one direct and one from jobbers direct; ten receive an additional 2 per cent, two from manufacturers direct and two through holding company contracts, four from jobbers direct and two from jobbers on holding company contracts.

RANGES—

	N.E.	M.A.	S.E.	E.N.C.	W.N.C.	S.W.	Mt. and Pac.	U.S.
Purchased from†								
Manufacturers.	3	..	1	7	4	1	2	18
	2*	..	1*	2*	1*	..	..	6*
Jobbers.....	3*	7	4	2	4	4	4	26
	1	..	4*	2*	1*	3*	..	13*
Both.....	3*	1	1*	1	..	..	1	5
Discount from†								
	(40) 3- and 3*	..	(40)-1*	(40)-5	(40)-2 and 1*	(35)-1*	(40)-1	(40)-11 and 5*
Manufactrs.	(50)-1*	..	..	(32)-1	..	..	..	(50)-1*
								(32)-1
								(35)-1*
Jobbers....	(40)-3*1	(40)-5	(40)-2 and 1	(40)-2	(40)-2	(40)-2*	(40)-5	(40)-17 and 9*
	(50)-1*	(30) to 32½	(30)-1*	(40)-1*	(40)-1*	(40)-1		(30)-2 and 1*
	(30)-1							(50)-1*
	(10)-1							(10)-1

In addition to discounts listed, ten companies receive discounts on balance; for example, 40 and 5, or 40 and 2. Three receive 5 per cent additional discount from manufacturers, two through holding company contracts, one direct; seven receive 2 per cent additional; one from manufacturer direct, four from jobbers direct and two from jobbers on holding contracts.

IRONERS—

	N.E.	M.A.	S.E.	E.N.C.	W.N.C.	S.W.	Mt. & Pac.	U.S.
Purchased from†								
Manufactrs..	4	5	2	6	3	1	0	21
	1*	..	1*	3*	3*	..	..	8*
Jobbers.....	3	2	4*	3	3	3	6	23
	3*	..	3	2*	1*	3*	..	13*
Both.....	2*	1*	..	1	..	..	1	4*
	1	..	..	1*	..	..	..	3
Discount from†								
Manufactrs..	(40)-3* and 2	(40)-2	..	(40)-4 and 1*	(40)-2	..	(40)-1	(40)-11 and 4*
	..	(50)-1	..	(32)-1	..	..	..	(50)-1
	..	..	..	..	..	..	..	(32)-1
Jobbers.....	(40)-2* and 2	(40)-3	(40)-2* and 1	(40)-3	(40)-2	(40)-2* and 1	(40)-5	(40)-17 and 6
	(10)-1	..	..	..	..	..	..	(10)-1

In addition to the discounts listed, nine companies receive discounts on balance. Two receive 5 per cent additional—one direct from manufacturer and one direct from jobber; six receive an additional 2 per cent, four from jobber direct, one from jobber on holding company contract and one from manufacturer on holding company contract; 10 per cent additional is received by one company purchasing direct from manufacturers.

WATER HEATERS—

	N.E.	M.A.	S.E.	E.N.C.	W.N.C.	S.W.	Mt. and Pac.	U.S.
Purchased from†								
Manufactrs.	4	4	2	6	3	3	2	24
	1*	..	2*	2*	..	..	..	5*
Jobbers.....	1	2	3*	1	3	4	5	13
	..	..	2	1*	..	2*	..	6*
	2	1	1*	1	1	1	..	6
Discount from†								
Manufactrs.	(40)-2 and 1*	(40)-3	(40)-1	(40)-4	(40)-2	(35)-1 and 1*	(40)-1	(40)-14 and 1*
	(30)-1	(33⅓)-1	(30)-1*	(32)-1	..	(40)-1	..	(30)-1 and 1*
								(35)-1 and 1*
								(33⅓)-1
								(32)-1
Jobbers.....	(40)-2*	(40)-2	(40) 1* and 1	(40)-2 and 1*	(40)-2	(40)-1*	(40)-3	(40)-10 and 5*
	(10)-1	..	(30)-1*	..	..	(50)-1	..	(30)-1*
								(50)-1*
								(10)-1

In addition to discounts listed, four companies receive discounts on balance, one company receives an additional 5 per cent from manufacturer direct; three companies receive 2 per cent additional, two from jobbers, one through holding company contract and one direct, and one from manufacturer on holding company contract.

REFRIGERATORS—

	N.E.	M.A.	S.E.	E.N.C.	W.N.C.	S.W.	Mt. & Pac.	U.S.
Purchased from†								
Manufactrs..	4	1	1	4	3	1	..	14
	..	..	1*	3*	..	..	..	4*
Jobbers.....	3*	4	5	2	6	4	4	27
	2	..	4*	2*	1*	2*	4*	16
Both.....	3*	2	1*	1	..	..	..	..
	1	1*	..	1*	..	1*	..	..
Discount from†								
Manufactrs.	(40)-1 and 2*	(40)-1*	(30)-1	(40)-1	(35)-1	(40 to 50)-1	..	(40)-2 and 3*
	(35)-1*	(30)-1	..	(30)-1	..	(30)-1*	..	(30)-4 and 1*
	(30)-1	..	..	(30 to 35)-1	..	..	..	(35)-1 and 1*
								(30 to 35)-1
Jobbers.....	(30)-2 and 1*	(30)-3 and 1*	(40)-1*	(30)-3 and 1*	(30)-2	(30)-2* and 1*	(30)-3 and 1*	(30)-13 and 8*
	(40)-2*	(40)-1	(30)-1	(40)-1	(27)-1	..	(25)-1*	(40)-3 and 3*
	(25 to 40)-1	(29 to 30)-1	(27½)-1	..	(30 to 40)-1	..	(40)-1	(25)-1*
	..	..	..	..	..	..	..	(30 to 40)-1
	..	..	..	..	..	..	..	(29 to 30)-1
	..	..	..	..	..	..	..	(25 to 40)-1
	..	..	..	..	..	..	..	(27½)-1
	..	..	..	..	..	..	..	(27)-1

*Buy on holding company contract. †Per cent in parentheses followed by number of companies reporting.

Building Public Relations

Customer and employee the keys.
Meeting the attack of agitators.
How to use publicity.
Capitalize romance and service.
Start with local properties.

THE solution of the public relations problem of the industry hinges upon the adoption of a program that need be no more vigorous or effective than that which sold the electrical idea to a hesitant and skeptical investing public at a time when funds for expansion were as imperative as friendly relations are today. The story was told well in one form then and it can be told well in another form now. The task rests in deciding upon those to be reached, the channels by which they are to be reached and what shall be delivered over the chosen channels. The customer is the most important person to appeal to and the local channels of approach are the most promising in effectiveness. Likewise, the material of the program can most profitably be the facts which will confirm and enhance the present general local satisfaction of the customer with the service he is, perhaps unawaredly, receiving.

The electric utility industry has passed through three stages and is in a fourth now. The initial stage of pioneering and promotion shaded into a highly technical development stage. As the public wakened to the fuller appreciation of electrical possibilities expansion took place, and it was necessary to pass through a large scale financing stage. The prevailing status today is predominantly a commercial ambition to anticipate the real needs of the customers; this situation invokes human elements as inevitably as any other commercially active enterprise does. The industry has become one which has something to sell; for long it was an industry from which people sought what electric service they thought they wanted.

During the preceding eras there was less occasion for attunement to the temper of the citizenry and consuming public than there is now when aggressive load building focuses attention upon the active competition for the customer's dollar. Commercial aggressiveness transcends the boundaries of the academic and legislative concept of utility regulation. The circumstances call for application of psychologic practices calculated to meet new factors which are brought to the surface by intensified competitive activity.

Five distinct categories of people are contacted in the rendition of electric service and each must be contemplated to a proportionate degree in any comprehensive program to re-establish the industry in such full public confidence that spurious political assaults will dissolve in the face of wholesome doubt as to the motives behind them and the soundness of the assertions on which they are based. These five groups are:

The citizen.
The investor.
The employee.
The customer.
The non-customer.

The Program

1. Concentrate on the customer and the employee.
2. Educate every employee until he becomes the incontrovertible and enthusiastic disciple of electrical integrity and sincerity.
3. Address the customer about his personal problems and electricity's contribution to their solution.
4. Capitalize every opportunity to interpret the utility policy and code of ethics in terms of actual accomplishments and events.
5. Confirm the local character of the utility enterprise and supplement with the national and regional significance.
6. Subordinate the intricacies of utility financing, technical complexity and rate theory to the more profitable study of the customer's personal requirements and reactions.
7. Capitalize modern interest in science and invention by dramatizing the romance that permeates the electrical system.
8. Supplant formalism in advertising by humanism in intimate approach.
9. Avoid all devious approaches in favor of the most direct channels.
10. Abandon apologetic defence and adopt vigorous retaliation to blatant misrepresentations.
11. In general, ignore the diffusive attack, trusting to undermine it by expanding local satisfaction into national assurance and confidence.

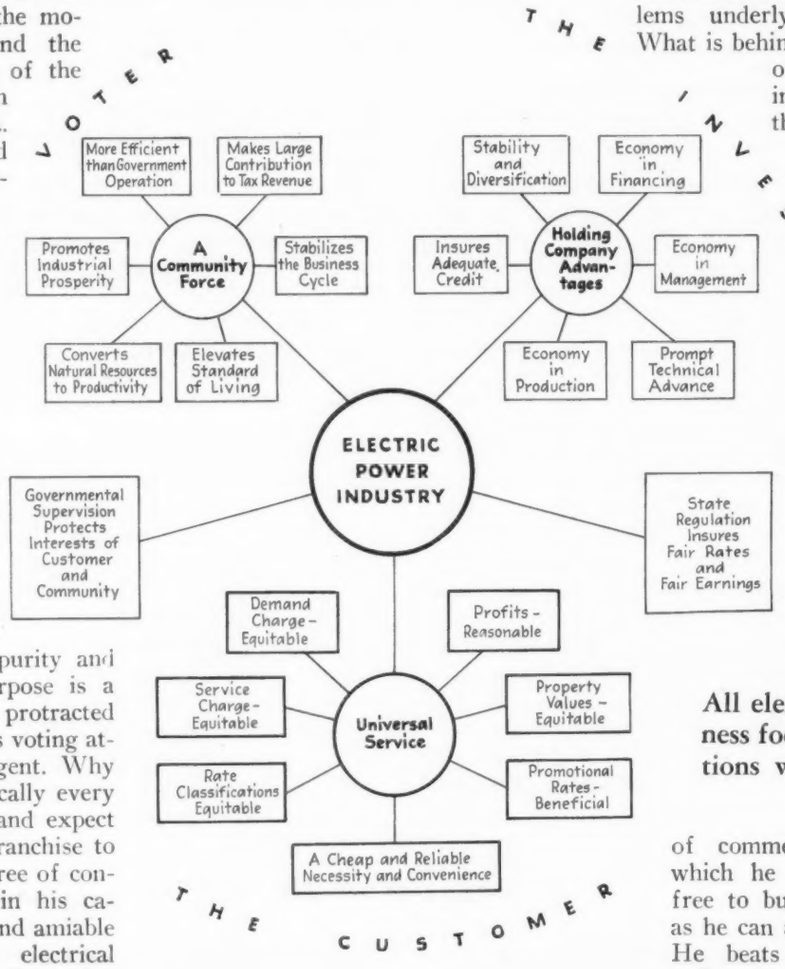
Today there are no sharp dividing lines between these groups. Citizens are customers. Employees are investors and customers. Non-customers are few and mostly on the unreached farms, but they even then may be utility investors; in fact, if they have bank deposits and insurance policies they are all indirectly investors. But the segregation for the purposes of a public relations program is not difficult if it is admitted that the entire approach can be made adequately through and to only two of these groups, namely, the employee and the customer.

Attempt to reach the citizen only in his capacity as a voter has largely failed. No matter how sincere the motives and how sound the subject matter, most of the efforts have been dubbed propaganda. In these enlightened days even the best-prepared information appears destined to fail wherever it lacks directness of method and application to the groups immediately involved in the public problem. To educate the citizen to understand the intricacy of utility operation, technique, financing and ethics, the political purity and honesty of civic purpose is a cumbersome and protracted method of making his voting attitude fair and intelligent. Why not admit that practically every voter is a customer and expect his exercise of the franchise to be guided by the degree of contentment he senses in his capacity as a satisfied and amiable beneficiary of the electrical idea? The really distressing thing about the public relations situation is that satisfaction is local and that all the doubt is about some vague national menace of a "power trust." Cultivation of existing friendly attributes is a more hopeful way of cementing friendship than argumentative conversion of a skeptical and casual acquaintanceship such as exists between the utilities and the general citizen. Therefore, concentrate the program upon the customer and trust to his citizenship.

The consuming public need be made aware of one thing only—that it is receiving a high degree of indispensable service at a price that is simple to comprehend, relatively inexpensive as compared with any available alternative and absolutely inexpensive as a medium of expression of his expended dollar. Only subconciously does the user need or desire to be aware of the large capital requirements or the physical elaborateness of the electric systems. To him the industry could well be as inconspicuous and unnoticed as the sources of most of his routine commodity purchases. He would prefer it that way. He would also prefer an industry capable of regulating itself to such an extent that state regulation would be superfluous or, at the most, perfunctory.

Again, to the consumer the electrical industry is ideally a local institution, an integral and essential component of his community, directly accessible to him and predominantly responsive to local economics, local civics and local psychology. He would welcome freedom from concern about the complex problems underlying utility services. What is behind the switch, the cock or the spigot does not interest him, except for the romance of science which it signifies, as long as the service and the product give him what he needs, in the way he wants it and at what he feels to be a fair price. He would welcome a removal of electric power from the political arena.

The consumer resents the status of a helpless supporter of a system, the victim of an "octopus." The character



All elements of the business focus on public relations with the customer

of commercial transactions in which he has the upper hand, free to buy when and as much as he can afford, appeals to him. He beats foreign rubber and coffee restrictions by his collective assertion of this prerogative. With a fuller recognition on his part of the real service rendered to him through electric channels he would be equally assertive in throttling at the source spurious efforts to curtail his present or future benefits from electric service.

The bulk of our thinking population is fed up on demagogy of all descriptions—Chicago has just manifested such a revulsion of feeling. The politician must be countered on a plane far above his own and by more fundamental resort to the sound measurable values at issue. Those values from the consumer's standpoint are personal, intimate and immediate. The issues which the politicians have striven to concoct are impersonal and remote in both time and place. Direct rejoinder to political attack should be restricted to categorical denial, by demonstrable facts and figures, of every erroneous, dis-

torted and exaggerated political utterance. Let there be no fear that the castigation of the "power trust" every time a concerted rejoinder is offered by the electrical industry will not ultimately lead to public query whether radical despotism is not a threat to public security when it attempts to deprive sincere individuals and sincere businesses of their right to defend their prerogatives. But having confined the direct rejoinder to such categorical denials, the balance of the effort should be aimed at building customer contentment by appeal to his own definite personal interests in cheap, plentiful and reliable electric service.

So far the public response to the national "power issue" has been mild and unenthusiastic largely because of contentment with the local situation. Alfred E. Smith has called the issue "too intricate a subject to get people to rally around." Other equally astute politicians have said that a clear-cut issue has no political potentiality; it is the vague and undefined issues about which glib, unanswerable phrases can be coined that win the support of the masses. Here, again, the answer is to remove the obscurity from the power question. That obscurity can be removed by proving to the customer that he gets more in return for his electrical dollar than he spends for either necessities or luxuries. Once sold on that fundamental concept and likewise rendered appreciative of the romance in the electrical evolution and revolution, he will perhaps then be ready to accept supplementary knowledge about the financing, management, regulation, investment, profits, etc.

To be critical, has the average customer a clear notion of the virtues of the electric lamp, vacuum cleaner or refrigerator by comparison with the candle, broom and window box of his childhood days? Has he a clear-cut conception of the contribution that electric power in industry has made to his unequaled standard of living? Has he a true appreciation of all the selfish advantages he has gained from electrical development? He senses these things about the automobile era, why not about the electrical era? He has been told, but not effectively. The telling done intelligently and with entire frankness should certainly enable him to see through the bunk of the agitator.

Take the obscurity out of the issue

With this as the prime motivation of a sound public relations program the next move is to formulate the mechanism of its administration so that gradually the public will see the obscurity removed from the whole institution of power service to home and industry. Calculated in terms of the known reading and listening habits of the public, it should take the form of reports of action rather than argumentation on ethics and justice. More people look at the daily news and news reels for events, episodes, real happenings and action than are willing to ponder over the didactics of economics, finance and regulation. The logical conclusions are:

1. Explain every service, rate, merchandising offer, expansion program and civic policy in terms of the self-interest of the consumer and the community. If no such self-interest can be found, the contemplated move probably lacks justification on the part of a regulated public utility.

2. Capitalize through all appropriate publicity channels those motives, policies and programs which can be identified with a definite action or event. Positive news value will attach to immediate reports of company acts, directors' resolutions, executive pronouncements and employees' activities, whenever they have a direct or indirect bearing upon the welfare of the consuming public. If a hostile press will not give space to news items favorable to both company and community, the company is by no means estopped from delivering its message; its audience is its consuming public, a mailing list is always available and the message may be included with the regular monthly invoice. Nor should advertising space be confined to the friendly press; the easily influenced public often reads the unfriendly press.

Convert code of ethics into accomplishments

A program to bring relationships with the general public to a deserved level of satisfaction should be formulated to embrace all phases of the problem.

1. Ascertain any remaining sources and items of local disaffection.

2. Frame a code of ethics pertaining to these points especially, but without overlooking all other essential points.

3. Convert the code of ethics into a series of acts, so that each precept becomes an accomplishment or event.

4. Choose only those channels of publicity which are natural and spontaneous, avoiding those which savor of "influence" and adroitness.

5. Ignore the broadsides of the political opportunist except to meet his mis-statements, exaggerations and distortions by immediate factual rejoinder.

There are many potential origins for the public doubt which can be inflamed into disaffection and antipathy merely because the issues are more or less wrapped in technical obscurity. There appear to be five categories of these sources of distrust—political, legal, economic, financial and local-personal. The subject matter of the public relations approach should take cognizance of these factors and correct the public thinking on them as a corollary to the prime motivation of reassuring the customer that he is unconsciously receiving an inexpensive, reliable and convenient service which is founded on an art replete with the romance of science and invention.

Political—1. The disposition of the public to accept without question the accusations against the power industry is a manifestation of political unrest of international scope.

2. Socialistic measures, despite American antipathy to the socialist's concepts, seem to be gaining ground steadily as a possibly inevitable adjunct of a highly organized industrial society.

3. The breakdown of the two-party system provides the chance for opportunists to exaggerate the issues and consolidate their socialistic gains by forcing the federal government still further into the realms of private business.

Legal—1. Acceptance of regulation by the state as an effective safeguard of individual rights had made sound progress until the entrance of the holding companies took certain areas of regulation outside the scope of the local commissions.

2. The notion of the inherent and legalized monopoly of utility business had likewise met with acceptance until the inspired fear of a nationalized monopoly aroused the common antipathy to big business. The American public

is conscious of both the benefits and the detriments of big business, but fails to see why the benefits of power correlation could not have been obtained without sacrificing the benefits of locally responsive management.

Economic—1. American attitude until recently has been mildly favorable to the chain store idea because it has manifest economic advantages. Lately there has been a growing realization that it has expanded to the point where management is being concentrated in the hands of unresponsive absentee executives. The fear is that the United States is drifting into pronounced economic feudalism and that the outlook for success in small independent businesses is gloomy. The utility holding company is placed in a correspondingly unfavorable light by its partial resemblance to chain store aggregations.

2. Acquisition of local companies has often resulted in a "write-up" of book values. These are difficult for the lay reader to understand as being appropriate for utilities, even though he is dimly aware that it is the common practice in most other lines of business. Capitalization of property built out of surplus appears to those elements of the public unfamiliar with accepted business methods to be incompatible with the concept of "fair value," "fair return" and "fair rates."

3. Overemphasis on academic discussions of bases of appraisal and valuation has obscured the element of value of service to the user and exaggerated a controversial element of cost of production.

Financial—1. Phenomenal rise and equally phenomenal drop in the market value of both preferred and common stocks has recalled the assurances of some promoters and exploiters that utility values are not only immune to depression but also hold attractive speculative possibilities. Speculative opportunity seems to many people incompatible with the intent of regulation to assure fair rates.

2. Placarding in news columns of growing profits and expanding surpluses of utility aggregations also clashes with the concept of rates regulated to produce a modest margin of profit.

Local and Personal—1. Some disparity between power and household rates is recognized as economically proper, but wide disparities heralded in claims about low power rates strengthens the householder's readiness to accept accusations of discrimination on a purely personal basis.

2. The service charge is paid, but not unequivocally accepted as equitable. The proof that it has an ultimate benefit to every consumer, large or small, has not been demonstrated, but it ought to be easy to do so.

3. Aggressive energy sales promotion and merchandising programs are admittedly essential to the sustained progress of utility service. However, much of it has been coached in terms of commercialism, more toned to indicate selfish motives of the utility than a contribution to the self-interests of the prospective user. The average patron looks upon his utility as distinct from purely mercantile enterprises; to him the utility is still primarily an agency satisfying wants that he originates and expresses.

4. When the individual views the railroad or the telephone he perceives media for personal transactions between scattered communities and involving the transportation of people, goods or ideas. In the power field he sees no such elements making it inherently a nation-wide institution. To him his electric service is essentially a personal transaction, completely bounded by his interests and those of the local power agency; it involves no transaction between him and any other community. If there are definite pecuniary advantages to him from physical electrical connection with those communities he may tacitly admit them, but he still wonders why they could not have been effected without financial and corporate consolidations.

Imbue employees with customer philosophy

These are the factors, then, which make the power issue highly intricate and difficult of formulation into a unified program of corrective publicity. Those are the doubts and the answers must dispel them. Direct argumentative approach has not proved effective or even complaisantly acceptable. The story must be told as an adjunct of the one thing that interests the individual citizen more than anything else—just what has he been getting and what is he going to get personally and selfishly from this electrical era.

Certainly no such ideal retention of public sympathy and support can be effected unless the employees of the industry are imbued with this customer philosophy. To attempt to educate the general public to the intricacies of financing, management, technology and differentiating economics of the electric industry has proved futile by past methods. Within the industry itself, however, these things must be known, and almost to the point of intuition. In no other way can it be hoped to leaven public opinion by the living example of a third of a million employees. Such a program is already well under way and promises to do the requisite job effectively and enthusiastically. It now seems to be recognized that a degree of comprehensiveness not previously attempted or even comprehended has been made necessary by the swing of the pendulum.

The ranks of the industry must know its antecedents, its history, its romance, its evolution and transitions, its ethics and its mistakes, its economic and social function, its potentiality for good, its economic and psychological obstacles and, finally, its true place in an industrial civilization. When this has been done any sagging of morale of utility staffs will be bolstered by dispelling all internal doubts as to the holding company and whether policies are really local or invisibly remote and vaguely restrained by unseen agencies.

No more important task for the executive group

The principles of sound economics and social justice will have to compete with the machinations of the demagogue in establishing the status of the electric power business of the next decade. It is a task worthy of the best brains in the industry. It is a task for the executives and not a casual job to be delegated lightly to professional publicists. If any job is to be delegated, let it be that of administering the properties on their present plane of high efficiency, in order that the leaders may be free to apply themselves to the problem of public relations.

Utility executives must be wholeheartedly in the effort with their entire organization if the public is to be convinced of the sincerity and universality of the industry's effort to convert its present local acceptance into a national feeling of assurance and confidence.

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1. **L. R. Nash**
Rate Research

2. **P. S. Arkwright**
Charles A. Coffin Prize
Public Policy

3. **R. F. Pack**
Constitution and By-Laws

4. **Irvin W. Day**
Codes and Standards

5. **Britton I. Budd**
Railway Electrification

6. **Sidney Z. Mitchell**
Finance

7. **Frank W. Smith**
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Civic Development

10. **W. H. Sawyer**
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13. **Eugene Holcomb**
Rural Electric Service

14. **E. W. Jahn**
Motor Transportation

Business Opportunities in Electrical Markets

$2,000,000,000 additional annual revenue
$4,000,000,000 in electrical manufactures

DEVELOPMENT in any one branch of the electrical market generally brings growth in other branches. Failure to recognize this unit of interest can only delay progress. Thus, the electrical water heater as a practical household device would have been out of the question in 1890. To-day thousands are in use.

Industrial electric power became possible because central stations, built for lighting, could sell energy for power during daylight hours at commercially practicable rates. The successive steps are well known: Greater use-factor of the generating plant and equipment; lower rates; electric appliances brought within the reach of more and more users, as to both initial and operating costs; technical advances in all directions made possible because manufacturing and power-producing enterprises had become big enough to afford the huge expenses of research; new applications; further energy price reductions, inducing broader use and in turn made possible thereby—in short, the creation of a vast, intimately interrelated industry or group of industries covering electrical manufacturing and the energy stream from source to final application.

In the tables certain data on the present status of the light and power industry are set forth and the possibilities of the immediately available markets are indicated.

The conclusion is reached that energy sales can be trebled, or more, and revenue doubled, the value of equipment in use being correspondingly increased so that the transition will bring heavy purchases of electrical goods as well as an increase in energy consumption.

The totals are for the year 1930. To bring into view some markets that, though now small, are likely to grow rapidly, it has been necessary to estimate their present magnitude and separate them from the groups with which they are usually associated. This reclassification accounts for divergences from the figures as usually given.

Where assumptions had to be made, for example as to the value of present installations or the load requirements of potential business, these have been based on known unit figures or reasonable probabilities.

The Heating Load—The primary prospect is the heating load, residential and technological. The strong drift toward the former is a matter of common knowledge. It accounts in large measure for the recent rapid increase in consumption per customer. High averages already attained over service areas of considerable size and much higher individual sales, which are becoming fairly common, make 3,000 kw.-hr. an attainable national average. The increase will entail long-hour use and a building up

Table I—All Markets Show Electrical Business Opportunities

	Present Business	Total Available Present Business
Annual Kilowatt-hours		
Domestic	11,640,000,000	76,700,000,000
Commercial lighting	11,500,000,000	15,800,000,000
Industrial motors	37,250,000,000	55,000,000,000
Industrial heating	3,700,000,000	63,000,000,000
Commercial cooking	430,000,000	6,300,000,000
Railroads	6,800,000,000	23,500,000,000
Miscellaneous	4,800,000,000	24,000,000,000
Total	76,120,000,000	264,300,000,000
Annual Revenue		
Domestic	$705,000,000	$1,535,000,000
Commercial lighting	485,000,000	600,000,000
Industrial motors	560,000,000	715,000,000
Industrial heating	55,000,000	685,000,000
Commercial cooking	13,000,000	64,500,000
Railroads	68,000,000	235,000,000
Miscellaneous	112,000,000	390,000,000
Total	$1,998,000,000	$4,224,500,000

	Present Business	Total Available Present Business
Maximum System Demand (Kw.)		
Domestic	4,000,000	9,000,000
Commercial lighting	5,400,000	6,700,000
Industrial motor	17,000,000	25,000,000
Industrial heating	1 500,000	22,500,000
Commercial cooking	200,000	3,000,000
Railroads	4,000,000	16,000,000
Miscellaneous	4,500,000	20,500,000
Total	36,600,000	102,700,000
Value of Electrical Equipment Used by Customers		
Domestic	$1,800,000,000	$5,000,000,000
Commercial lighting	150,000,000	220,000,000
Industrial motor	380,000,000	560,000,000
Industrial heating	10,000,000	150,000,000
Commercial cooking	6,000,000	90,000,000
Railroads	30,000,000	120,000,000
Miscellaneous	20,000,000	110,000,000
Total	$2,396,000,000	$6,250,000,000

of valleys in the load curve. Even on a very conservative assumption as to the rates to be charged on the increment the present domestic revenue will be more than doubled.

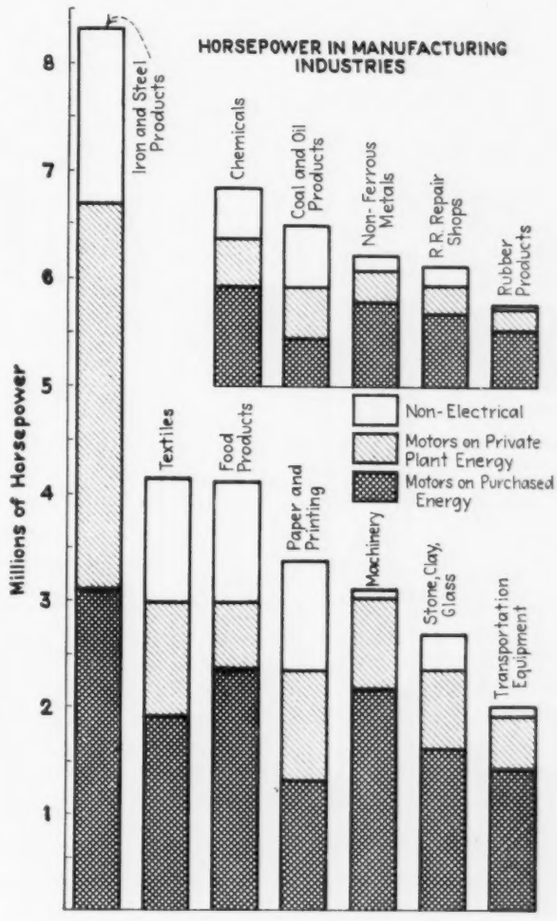
The other great prospect is the expansion of industrial heat applications. Exact figures on present consumption are not available. Table V gives the estimates. A survey some years ago indicated potential yearly sales well in excess of the 63,000,000,000 kw.-hr. here adopted. The revenue, $685,000,000, also is believed to be conservative.

Other Loads—Commercial lighting (Table III) has been taken as somewhat less than present total commercial retail sales, which include small motor drive and some commercial cooking. The estimated available increase in revenue works out slightly under 25 per cent, the equivalent of only a few years' growth.

Railway operation, including street railways, now brings in about 3.5 per cent of the central-station revenue. While surface lines have been feeling the effects of competing forms of transportation the demands of suburban areas for rapid transit continue to increase. The large field is in the further electrification of steam roads. For the central station this load presents two favorable prospects: The several important projects undertaken within the past few years point to further expansion of electrical operation; in their electrification programs railways have shown a decided tendency to purchase energy rather than to build their own generating stations.

On much of the trackage traffic density is considered too low to justify electrification, but fully 25 per cent could profitably be operated electrically. This estimate, partly counterbalanced by a decrease from present figures for street car operation, leads to a prospective total of 23,500,000,000 kw.-hr. and revenue of $235,000,000.

Electrified trackage is 39,475 miles of railway and 4,850 miles of electrified railroads. In addition to purchased energy, almost 3,000,000,000 kw.-hr. was generated during 1930 in the plants of the ten largest users of electrical energy alone. Total steam railroad trackage at the latest available date was 427,750 miles, on 262,713 operated route-miles. The available load is based on the assumption that all of the energy that is required for electric transportation is sold by central stations.



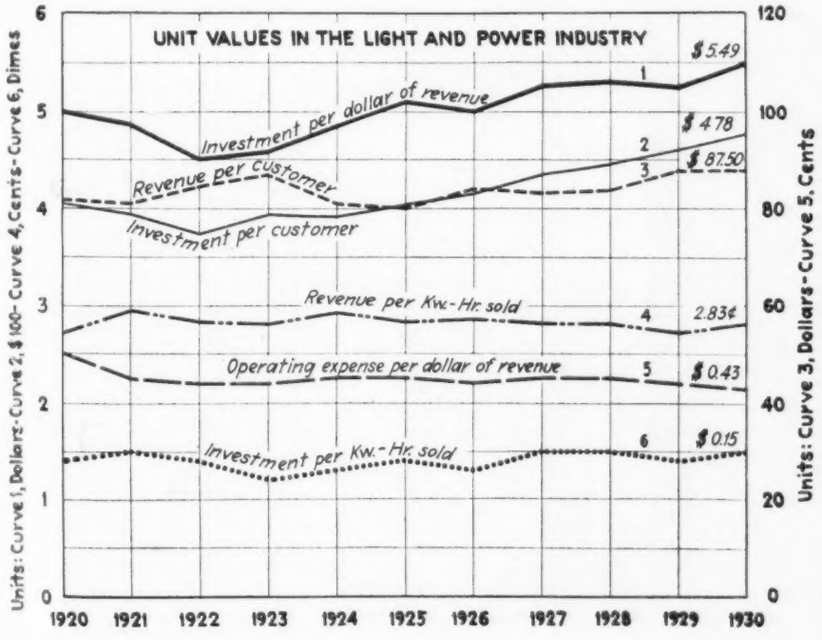
Electrification in major industry groups

Only half the horsepower is on central-station energy. Nearly 10,000,000 hp. is non-electrical. Small and miscellaneous groups omitted from chart.

The Manufacturing Load — Power for industrial motor drive now constitutes the largest item as to energy use and the second largest as to revenue.

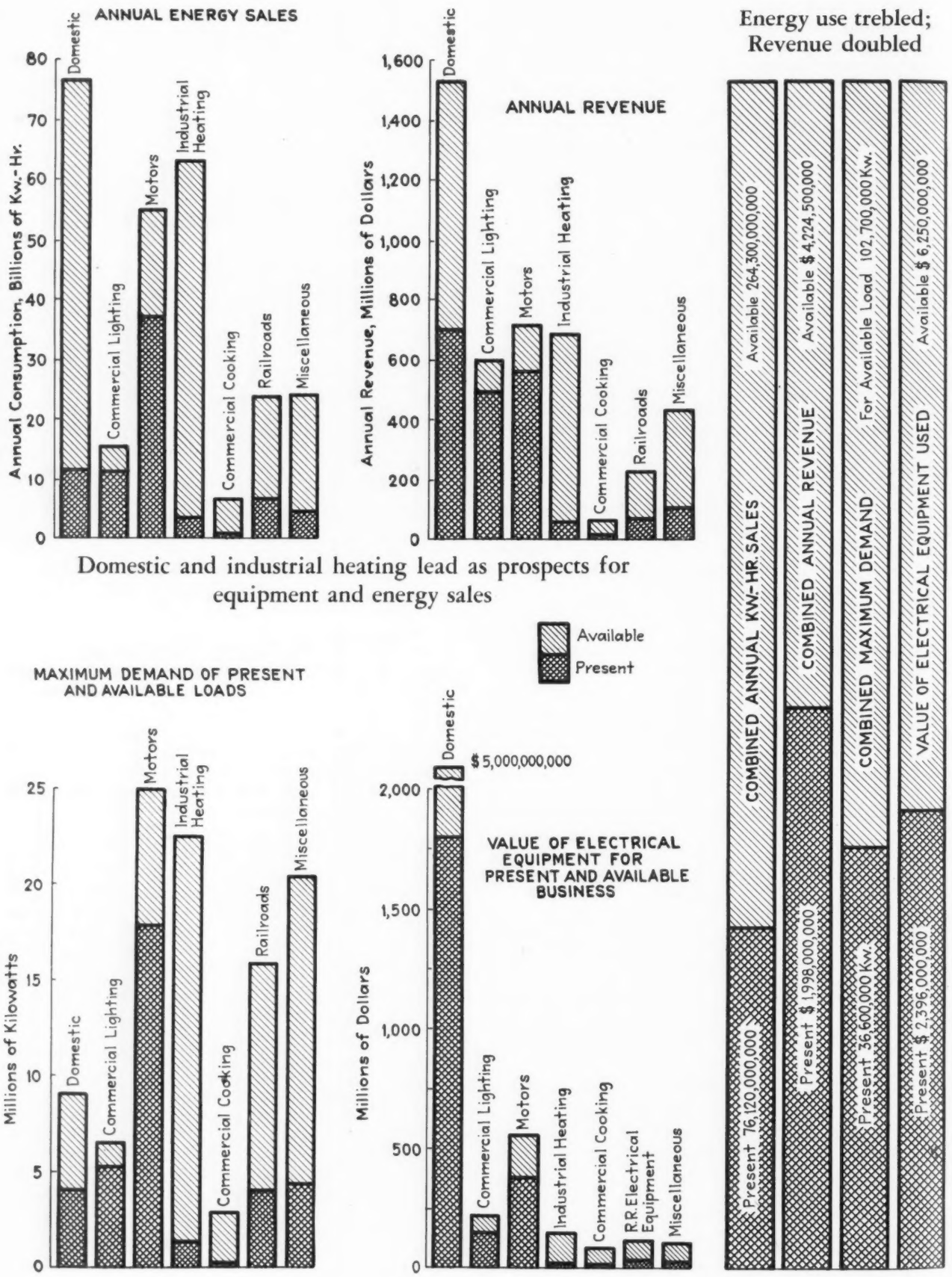
In ten years the horsepower of industrial motors operated on central-station energy more than doubled. Table IX shows the rating for each of the major manufacturing groups as reported in the 1927 census. The increase in the two following years of great activity undoubtedly brought the total well above 20,000,000 hp.

But this 20,000,000 hp. constitutes only half the total horsepower used in manufacturing. Much of the remainder may also be viewed as potential central-station business. In part it is already electrically operated; more than 11,000,000 hp. is driven by energy generated in the establishments reporting.



To get a dollar of return in 1930 required 22 per cent more investment than in 1922

Possibilities of Increase in Present Electrical Markets



Domestic and industrial heating lead as prospects for equipment and energy sales

Table II—Domestic Business

	Present Business	Available Business
Number of customers	20,438,774	25,588,000
Kilowatt-hours sold	11,640,000,000	76,700,000,000
Revenue	$705,000,000	$1,535,000,000
Average annual use per customer, kw.-hr.	568	3,000
Load factor, per cent	22	55
Value of appliances in use	$1,800,000,000	$5,000,000,000
Average annual revenue per customer	$34.50	$60.00
Maximum demand on system, kw.	4,000,000	9,000,000

Table III—Commercial Lighting, Signs and Windows

	Present	Available
Number of customers	3,663,946	3,960,000
Kilowatt-hours sold	11,500,000,000	15,800,000,000
Revenue from energy sales	$485,000,000	$600,000,000
Value of lamps and fixtures, etc.	$150,000,000	$220,000,000
Load factor, per cent	17	19
Maximum demand, kw.	5,400,000	6,700,000

Table IV—Industrial Motor Load

	Present	Available
Number of customers	515,000	615,000
Annual kilowatt-hours sold	37,250,000,000	55,000,000,000
Annual revenue	$560,000,000	$715,000,000
Load factor, per cent	22	22
Maximum demand, kw.	17,000,000	25,000,000
Value of equipment	$380,000,000	$560,000,000

Table V—Industrial Heating Load

	Present	Available
Number of customers	200,000	500,000
Annual energy use, kw.-hr.	3,700,000,000	63,000,000,000
Annual revenue	$55,000,000	$685,000,000
Load factor, per cent	17	20
Maximum demand, kw.	1,500,000	22,500,000
Value of heating equipment	$10,000,000	$150,000,000

Table VI—Commercial Cooking

	Present	Available
Number of customers	30,000	175,000
Annual use, kw.-hr.	430,000,000	6,300,000,000
Annual revenue	$13,000,000	$64,500,000
Load factor, per cent	25	25
Maximum demand, kw.	200,000	3,000,000
Value of heating devices	$6,000,000	$90,000,000

Table VII—Railroad and Railway Electrification

	Present	Available
Miles of track electrified	44,325	122,000
Annual energy use, kw.-hr.	6,800,000,000	23,500,000,000
Annual revenue	$68,000,000	$235,000,000
Load factor, per cent	14	16
Maximum demand, kw.	4,000,000	16,000,000
Value of electrification equipment	$30,000,000	$120,000,000

Table VIII—Miscellaneous Uses; Street and Highway Lighting, Traffic Signals, Trucks, etc.

	Present	Available
Annual energy use, kw.-hr.	4,800,000,000	24,000,000,000
Annual revenue	$112,000,000	$390,000,000
Load factor	25	28
Maximum demand, kw.	4,500,000	20,500,000
Value of equipment	$20,000,000	$110,000,000

In the past industries requiring heat as well as mechanical power could often produce the latter largely as a byproduct, and were therefore poor prospects as buyers of electrical energy. Development of methods for off-peak electric heating and heat storage have made it necessary to reappraise this factor.

In some of the largest power-using groups much less than half the horsepower is driven by central-station energy, though the present extent and past growth of purchased power indicates its practicability and increasing acceptance.

Maximum Demand—The peaks of the various kinds of load come at different hours. Consequently the rated generating equipment is much less than the sum of the several maxima. At present this total, 36,600,000 kw., is being carried by about 32,000,000 kw. of generators, of which a considerable fraction is reserve capacity. For the estimated available load the condition is even more favorable. Though the sum is 180 per cent greater, the increment in generating equipment will not be so large.

Value of Equipment—The value of consumers' equipment now in use can only be estimated. However, the additional loads will obviously require it to be greatly increased. The addition will amount approximately to $4,000,000,000. This does not include the added central-station equipment—prime movers, generators, transformers, line material, control apparatus, substation equipment, customers' meters and the rest—necessary to care for the added load.

Unit Valuation—Parallel with rising investment per dollar of revenue and per customer there has been a decrease in the operating expenses (exclusive of taxes) per dollar of revenue and an increase in revenue per customer. The added loads by improving the load factor should reduce the investment per kilowatt-hour sold, while further increasing the sales per customer.

Table IX—Industrial Market Half Developed

1927 Census of Manufactures

Industry	Number of Establishments	Total Horsepower	Purchased Horsepower	Unserved Horsepower	Per Cent Purchased
Food products	46,564	4,134,973	2,354,875	1,780,098	57.0
Textile products	24,873	4,173,438	1,934,666	2,238,772	46.3
Lumber products	18,830	3,321,755	1,049,487	2,272,268	31.6
Iron and steel products	6,189	8,323,037	3,100,912	5,222,125	38.7
Chemicals	6,276	1,851,490	941,787	909,703	50.8
Paper products	2,935	2,814,795	797,601	2,017,194	28.4
Coal and oil	1,259	1,510,133	434,164	1,055,969	28.7
Stone, clay, glass	7,996	2,709,131	1,623,099	1,076,032	58.2
Machinery	11,758	3,009,265	2,172,186	827,079	72.6
Printing	22,078	568,427	524,473	43,954	92.1
Rubber	495	790,622	517,718	272,904	65.5
Leather	3,958	419,591	202,497	217,094	48.2
Non-ferrous metals	5,254	1,219,598	781,250	438,348	64.1
Transportation equipment	2,484	2,027,686	1,446,450	581,236	71.2
Railroad shops	2,016	1,110,821	674,722	436,099	60.5
Miscellaneous	11,153	840,919	566,422	274,497	67.3
Total	174,118	38,825,681	19,132,310	19,693,371	49.3

Table X—Unit Values in the Light and Power Industry

Dollars	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Investment per dollar of revenue	5.00	4.87	4.50	4.68	4.86	4.10	5.00	5.25	5.30	5.25	5.49
Operating expense per dollar of revenue	0.50	0.45	0.44	0.44	0.45	0.45	0.44	0.45	0.45	0.44	0.43
Investment per customer	405	393	377	395	393	405	417	437	446	460	478
Revenue per customer	81.5	80.7	85.5	87.0	81.0	80.0	84.0	83.1	93.8	87.3	87.5
Investment per kilowatt-hours sold	0.14	0.15	0.14	0.12	0.13	0.14	0.13	0.15	0.15	0.14	0.15
Revenue per kilowatt-hours sold (cents)	2.71	2.97	2.85	2.80	2.94	2.83	2.85	2.83	2.83	2.73	2.8

Departures from Customary Merchandising Practices

NUMEROUS departures from the customary merchandising methods have been made by utilities in different parts of the country in an attempt to make the most complete use of electric service available to customers under attractive conditions and still earn a reasonable profit from the combined merchandising and electric service business. These plans have been built around policies intended to create the best trade relations and hence the widest spread development of the electrical business.

Among sections prominent for departures in merchandising methods are Georgia, Virginia, Boston, Poughkeepsie, Winnipeg, Long Beach, Fresno, Vancouver and the Northwest. The features of these plans will be outlined separately, as no one element, but the combined elements in each plan constitute the distinction.

Co-operative merchandising involving a commission to dealers and contractors, establishment of a "controlled off-peak" rate in addition to a promotional rate and absorption of range-wiring cost by the utility constitute three major factors that have accelerated residential load building on the Boston Edison system of late.

Co-operative merchandising went into effect in 1926. The plan, which has been widely published, is based upon the principle that the best public service can come only from a united industry, organized for legitimate profit and mutual helpfulness. Leadership in pioneering work and in the maintenance of first-quality service and appliances marketed is the utility company's duty. All contractors and dealers are paid a 10 per cent commission on electric appliance sales resulting from "leads" turned in by them to the Edison company. A force of salespeople trained in all branches of electrical merchandising is placed at the dealers' command, minimizing their selling time and assuring a clear profit. Appliances priced under $25 are no longer sold on time and major devices are sold on lease terms comparable to department store practice.

On April 1, 1931, a "controlled off-peak" water-heating rate was established of 3 cents per kilowatt-hour for the first 25 kw.-hr used per month, plus 1 cent per kilowatt-hour for the excess. Above 5 kw. there is a demand charge of $12 per kilowatt per year to protect the investment in commercial applications. This off-peak rate does not apply to the restricted hours—3 p.m. to 10 p.m., October-April inclusive.

An unlimited-use inducement rate, inaugurated in 1926 and modified in 1929, charges 7.5 cents per kilowatt-hour for the first 3 kw.-hr. per 100 sq.ft. area, 5 cents per kilowatt-hour for the next 6 kw.-hr. and 3 cents per kilowatt-hour for the excess. The minimum area allowed is 1,000 sq.ft. and the minimum charge is $9 per year.

These rates have encouraged the development of residential business, and while the reduction in the top rate from 8.5 to 7.5 cents in 1929 affected revenue adversely for a time, the lowering of the energy charges has contributed to load upbuilding. The water heating business has been under way too short a time to give results.

Absorption of wiring costs for ranges on ground-floor installations became effective in October, 1930. In 1929 216 ranges were sold, in 1930, 691. To May 1 this year 360 ranges have been sold and the outlook is excellent. This policy quickened the demand and its effects will be felt indefinitely. More than 200 ranges have been sold to employees on special terms since March 1, following a demonstration meeting with an attendance of 2,000.

Co-operative merchandising with commissions to dealers and contractors.

Controlled off-peak rates in addition to promotional rates.

Absorption of range-wiring costs by utility.

Compensating salesmen for estimated energy revenue.

Paying salesmen for sales made by other outlets.

Spending one-third of first year's revenue for promotion.

Utility accepts pioneering as its job.

Merchandise accounting that removes trade objections.

Utility voluntarily withdrawn from merchandising.

Full-use electric home plan.

The company is vigorously developing heavy-duty appliance sales. In the past two years about 3,300 electric refrigerators have been sold by the company alone and 770 units were sold to May 1, compared with 540 for the same period in 1930. Some 25 water heaters were marketed the first month on "controlled off-peak service" at prices ranging roughly from $113 to $350 installed. The 1-cent energy rate puts this business on a plane competitive with fuel heating.

Since 1925 the energy consumed per residential customer has increased from 417 to 525 kw.-hr. and the average rate per kilowatt-hour sold to residence customers has decreased 21 per cent. Total appliance sales have increased from about $750,000 to slightly more than $1,000,000. Many apartment dwellers using relatively small amounts of energy are served, but the growth of business is consistent and promising.

4,000 kw.-hr. per domestic customer

Winnipeg, Canada, has so frequently been cited because it has 55 per cent saturation on electric range use and 40 per cent on water heaters that some of the conditions contributing to this situation will be related. Its average domestic consumption of 4,000 kw.-hr. can be attributed chiefly to four factors:

1. The citizens have a distinctly pioneer disposition or eagerness to adopt new methods and buy new things because they live in a relatively new territory and are not weighted down with traditional physical impediments or old habits that must be shed.
2. Sources of fuel—coal, oil and gas—are relatively remote, so they create little competition with electric service.
3. Low rates are made possible by the relatively inexpensive base-load hydro plants with surplus water supply, short transmission lines, absence of expensive system refinements required to give the service continuity demanded elsewhere, and large energy usage per customer.
4. Extensive public acceptance has been manifested in ample house-wiring facilities and outlets, as typified by the wide use of "Read Seal" homes averaging 75 outlets per home. More than half of all new dwellings are awarded "Red Seal" certificates.

Field salesmen work on a commission of 10 per cent only. Other sales outlets are encouraged by selling appliances at list price, allowing dealers to purchase from utility stocks at discount, and engaging contractors to wire and install equipment on contracts carried by the utilities.

The average annual energy revenue per domestic customer in 1930 was $35.83.

Utility merchandising is suffering from too much "mechanics" and too little "humanics," declares Edmund E. Walker, sales engineer of the British Columbia Electric Railway Company. By "humanics" he means exerting a greater effort to get the buyer's viewpoint and psychology.

On that system merchandising is carried on entirely separate from other utility functions and is being made to pay its own way. All legitimate charges are made against the company's merchandising activities. In the past merchandising has been in the red, but at present a small profit is being shown, and it is expected that the near future will see a net profit of 5 per cent.

With the exception of appliances sold in groups, terms to purchasers are 10 per cent down with from twelve months to two years on the balance. About eighteen months ago the company foresaw the possibilities of hastening complete electrification of the home by offering to group any number of appliances under one contract and give the purchaser a longer period over which to pay. A down payment of 10 per cent of the total sale price is required and the customer given 36 months to pay the balance with interest at 8 per cent. Under this plan about 70 group sales ranging from $800 to $1,000 have been made. Credit losses have been low and the company is enthusiastic over possibilities of the plan.

Seven retail stores are operated, supplemented by 71 outside salesmen. Salesmen are compensated on a salary and commission basis, the men working in groups specializing on various appliances. Range salesmen receive a salary of $100 plus a commission of 10 per cent of list price after the salesman's monthly quota has been sold. Men in the washer and ironer crews receive a commission of 12½-20 per cent, depending on the sales above quota. Salesmen in territories outside of Vancouver who do not specialize on one appliance are also paid on the foregoing basis. Refrigerator and radio salesmen receive a straight 10 per cent commission.

All appliances are purchased through jobbing outlets with the exception of some carload lots of washing machines and ranges, which are purchased directly from Eastern manufacturers. Everything is sold at manufacturers' list price at an average gross profit of 35-36 per cent.

Six months of the Long Beach range-merchandising experiment, with the Southern California Edison Company voluntarily withdrawn from merchandising until January 1, 1932, was concluded on May 1. It has given the dealers a chance to demonstrate by trial whether it is necessary for the utility to be active in merchandising in order to continue its present rate of growth.

Sales of the co-operating dealers during this period totaled 50 ranges sold at retail and 50 sold at wholesale, compared with 150 sold by the utility in the same period last year.

Some mistakes are admitted by the dealers and some lessons have been learned. For example, newspaper advertising alone will not sell ranges. Effective work cannot be done without organization and a trained staff of specialists. Unless dealers' activities are co-ordinated satisfactory results cannot be obtained. Margins on ranges are too small to allow dealers to promote them properly.

The experiment without the utility merchandising started with three department stores, two contractor-dealers, two specialty shops, two furniture stores and two hardware stores co-operating. They were not geared up, but are becoming more proficient.

At first the utility allowed the dealers to tackle the job as they chose, but on invitation agreed to help the dealers in various ways because they were not organized and did not have trained salesmen to undertake the job. Among the utility helps rendered were: Continuation of display and explanation of ranges in local offices; electric cooking advertising in newspapers; assisting dealer organizations with cooking schools and sales instruction; giving customers names of co-operating dealers and matching total dealer advertising in inches. The utilities transferred their salesmen to other districts where they are still merchandising.

The dealers also stock, display and promote range sales, develop sales staffs, participate in advertising campaigns and follow-up prospects. They quote installed prices, limit allowance for displaced equipment to $10 and require a minimum of $10 down with eighteen months to pay.

Based upon the theory that the power company can afford to spend approximately one-third the first year's revenue from certain load-building appliances, an arrangement is in effect whereby the San Joaquin Light & Power Corporation pays its subsidiary $5 per connected kilowatt for ranges, water heaters and heavy-duty appliances and $3.30 per connected kilowatt for any socket appliances that are campaigned during the year.

During 1930 the Valley Electrical Supply Company did a gross merchandising business of $1,000,000 (approximately $60 per domestic customer), adding 20,480 kw. of connected cooking and water-heating load, for which it received $102,400, and 2,798 kw. of appliance load, for which it received $6,156, or a total from the power company of $108,556. Besides this it added approximately 1,200 kw. of appliance load, including refrigerators, washing machines, standard appliances, etc., for which it received nothing from the power company. After paying all expenses, including the highest rent per square foot paid by any retail store in Fresno, it showed a net profit at the end of the year, which was returned to the power company.

For the 24,478 kw. of new business added the power company will receive an estimated annual energy revenue of $293,000; for this business it spent only slightly more than one-third the first year's revenue. On this basis the power company feels that it is good business.

Except in Fresno and Bakersfield, where the supply company maintains retail stores, its salesmen assist dealers and place all heavy-duty appliance sales through them. The power company pays the supply company for all such sales at the rate of $5 per connected kilowatt and the dealer makes the merchandising profit and handles all details, including time payments, directly with purchasers.

On convenience-outlet campaign specials the supply company turns over to dealers as many specials as they estimate they can sell and bills them at practically the supply company's cost. The supply company pays for all advertising and broadsides and lists dealers' names in its newspaper advertising. Dealers are encouraged to use specials only to stimulate the sale of similar standard nationally advertised appliances.

During the six years' operation under this plan average domestic consumption has increased from 463 kw.-hr. to 916 kw.-hr. per year and domestic revenue from $27.90 to more than $40 per customer. Dealers like the plan and are benefiting thereunder. The power company is building load at a rapid rate and is spending no more than it costs to obtain other classes of business.

V. H. Moon, sales manager of the Pacific Power & Light Company, considers that utility efforts in the merchandising field are necessary if a satisfactory load-building job is to be done, but makes every effort to co-operate with and assist dealers. He feels that the aggressive merchandising policy he is pursuing has accomplished its three main objectives:

It has increased the average annual consumption per customer from 322 kw.-hr. in 1920 to 1,170 in 1930.

Customer relations have been improved because merchandising has made possible more widespread use of electrical service in the home at a steadily declining cost. From an average cost of 9 cents per kilowatt-hour in 1920, greater use has made possible rate reductions that lowered the average cost to 3.25 cents in 1930.

Through a liberal policy toward dealers and the effort to develop all possible channels of distribution, friendly trade relations have been developed and maintained.

Four fundamental principles govern the company's merchandising policy and accounting practices:

1. The utility engages in merchandising activities chiefly to promote additional uses of its services. Even were it not so engaged promotional work would be aggressively carried on by the utility.
2. Those expenses which are caused directly by merchandising activities and which would not be incurred and could not be justified if merchandising were not undertaken, should properly constitute a merchandising charge.
3. The expenses that would be justified and incurred were the utility not engaged in merchandising should be charged to utility operating expense for promotion of new business.
4. One of the chief purposes of merchandising accounting is to show the amount of profit derived or loss sustained by the company from merchandising when it is charged with only such costs as are specifically incurred in its behalf; i.e., the loss or profit which would result to the utility from discontinuance of merchandising activities.

Its compensation of salesmen is based on the principle that the utility can afford to pay something for loads added, whether company salesmen or dealers make the sale. The salesmen work on a flat salary, ranging from $125-$200 per month, plus a bonus based on gross revenue added in territory as follows:

No. of Items* on Which Quota Is Attained	Load Building Bonus, Per Cent of Estimated Annual Revenue
7	10
6	8
5	6
4	4
3	2
less than 3	0

* Items on which quota is based—ranges, water heaters, refrigerators, washers, ironers, radios, vacuum cleaners.

Ranges and water heaters sold by dealers or utility employees not on utility sales staff and sales of used appliances contribute toward bonuses the same as company sales. However, no credit toward bonuses is derived from reverts, water heater sales that do not involve new customers, institutional, state and commercial sales or quantity sales (five or more) of ranges, refrigerators or water heaters which are handled by chief salesman or district manager.

This plan has been in operation only since the first of the year and may require modification, but it is believed by the company that it is right in principle and will do much to maintain good dealer relations because there is an incentive for salesmen to encourage dealers.

In promoting friendly dealer relations and eliciting their aid in the load-building task, the company recognizes

that dealers need no particular assistance on any appliances other than ranges and water heaters. (So far these two devices have not been successfully sold by other than the utility). Therefore the company finances dealer sales and wiring of ranges and water heaters and gives demonstrations the same as though sold by the company.

The power company will also service ranges sold by dealers providing they carry a stock of parts upon which the company's service department can call and providing the dealer pays the labor charge involved.

The company sells only one make of range, but another popular brand is carried in stock and consigned to dealers. Dealers make a profit of 25 per cent on the cash resale price of the range.

List prices are maintained on all appliances except occasional overstocks and monthly small-appliance specials. On these specials the company makes the best buy possible and supplies dealers at a price determined jointly by the jobber and the company in order to protect the jobber. This price is usually about the same as the dealer would pay were he to buy the goods in a large wholesale center for the territory as a whole. Only where no jobbers exist in a territory are appliances purchased directly from manufacturers, then usually in carload lots.

Dealers usually make a profit of about 30 per cent. The company pays dealers cash for contracts and carries them itself, so that to all intents and purposes the dealers make cash sales. Under this policy dealers may sell any make of range they desire and the company acts as their financial agency, the dealer making a profit just as though it were a cash sale. Purchasers pay installments through the dealers or the company, just as they desire.

Carrying charges to the purchaser are one-half of 1 per cent per month on the deferred balance. Terms vary somewhat, depending on competitive conditions.

Seventy-three kilowatt-hours per domestic customer were added by a 52-day range-and-water heater campaign recently completed on the Georgia Power Company's system. Twenty-six hundred and thirty ranges and 573 water heaters were sold, producing an estimated annual consumption of 8,000,000 kw.-hr.

Before selecting the type of water-heating system, rates and sales plan finally adopted a trial test was made in one community. Water heaters are sold for operation on a fifteen-hour daily charging basis and energy charged for at $1.11 per month plus 1.11 cents per kilowatt-hour. Sales efforts were concentrated on existing range users, but reduced prices and easier terms were allowed purchasers of the range-water-heater combination. Prices of water heaters included insulation of the hot-water piping, as it was realized that reduction of radiation would minimize the customers' energy bills.

Various data were prepared to help the salesmen aid the customers in selecting the right size equipment and provide answers to questions that always arise. Working drawings were also prepared to guide plumbers installing the heaters or adapting old heating systems to the new rate. More details will be published later.

Features* of the "Poughkeepsie full-use electric home" plan and the Virginia plan were presented in previous issues of ELECTRICAL WORLD.

Desiring to encourage as many legitimate retail appliance dealers as can economically operate in the same territory one large Pacific Coast power company is experimenting with three relatively new methods of utility merchandising.

In territory outside of two metropolitan areas served salesmen receive a salary of $100 per month, transportation allowances and a commission of 10 per cent on ranges and 15 per cent on all other appliances. In addition, a bonus on all dealer sales (excepting apartment house sales) is paid as follows: $1 per kw. on ranges, water heaters and major air heaters of 2 kw. and over on individual appliances. All ranges rate 7 kw.; water heaters 5 kw. and major air heaters over 2 kw. This plan is satisfactory to both salesmen and company.

In one of the two metropolitan areas a modification of this plan is in effect. No salary is paid, but a commission of 2 per cent is given on direct sales with a bonus on all sales, both company and dealer, of $2 per kw. on major appliances of 2 kw. and over per individual appliance. No commission is paid on direct sale of auxiliary heating, domestic lighting or cookers. This plan does not apply to apartment house solicitors; these men receive salary plus expenses. This experimental plan, placed in effect the first of this year, is working out satisfactorily so far. With this basis of compensation it is good business for the utility salesmen to sell all they can personally and at the same time encourage dealers to sell all the heavy-duty equipment they can.

A similar plan did not prove entirely successful in the other metropolitan area so a distinctly new plan was placed in effect April 15. Here dealers are being encouraged to take over range sales by paying them a commission of $15 on every range sold. This recognizes the principle that the utility can afford to spend a part (about one-third) of the first year's revenue to put ranges on its lines and further recognizes that the present margin of profit on electric ranges is not sufficient to prove attractive to large dealers. The company guarantees the wiring job at $60 for ordinary installations, which cover about 90 per cent of all cases.

As a still further inducement for dealers to push the electric range, the company will share 50-50 on trade-in allowances on fuel-fired ranges up to a limit of $20 payable by the company. In other words, the dealer can go as high as $40 on trade-ins, and, moreover, he may keep the old range.

The only requirement of dealers to participate in this plan is that they maintain a display, advertise and furnish the company with a copy of sales contracts for accounting purposes. So far about 100 dealers, both electrical and non-electrical, have come in on the plan. All large dealers were personally interviewed and response to the plan was most hearty.

The power company will not rely entirely upon dealers and is maintaining its own sales force to develop prospects. These men receive a straight salary, plus a bonus at the end of the year providing the over-all quota has been reached. The power company will advertise and conduct a direct mail campaign to reach the 31,000 prospects now using wood or coal ranges.

*Virginia plan, ELECTRICAL WORLD, page 1084, December 13, 1930. Poughkeepsie plan, ELECTRICAL WORLD, page 444, March 7, 1931.

Men of the Industry

J. C. McQuiston Retires

J. C. McQUISTON, general advertising manager of the Westinghouse Electric & Manufacturing Company for 29 years and one of the best-known advertising executives in America, has announced his retirement effective June 1. He plans to start on an extended cruise around the world with his wife and daughter. A sketch of Mr. McQuiston's long services to electrical advertising and reference to the principles that have governed his activities will appear next week.

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Dr. McLaughlin Resigns as Head of Shannon Development

DR. THOMAS A. MCLAUGHLIN, managing director of the Electricity Supply Board of the Irish Free State, together with J. J. Murphy, another director, has resigned his post, owing, his statement says, "to the fact that differences of opinion on major matters of policy have existed for a long period between the executive council and myself." Just what these differences were has not been explained, but the government expressed much regret in accepting his resignation and great appreciation of his past services.

Dr. McLaughlin has been regarded as the founder of the Shannon scheme. After graduation from the Irish National University he became attached to Siemens-Schuckert of Berlin and interested this firm in the project which it afterward carried to completion for the Free State. Dr. McLaughlin also was largely instrumental in originally convincing the Irish authorities and the Dail that the development was feasible and inducing them to authorize it. As the managing director he played a major part in bringing about ahead of the scheduled time the requisite consumption of energy to make the plant self-supporting. Dr. McLaughlin visited the United States a few years ago, and the friends he made here will share the regret of his Irish supporters that events should have brought about his resignation.

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J. S. TRITLE, vice-president of the Westinghouse Electric & Manufacturing Company in charge of manufacturing operations since 1929, was elected vice-president and general manager in charge of manufacturing, sales and engineering operations of the company at the meeting of the board of directors held May 27.

R. H. BALLARD, president of the Southern California Edison Company, Ltd., Los Angeles, Calif., has been elected to the board of directors of the California Chamber of Commerce. Mr. Ballard has been active in committee work for the State Chamber of Commerce for the past several years.

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OBITUARY

Edward Dean Adams

EDWARD DEAN ADAMS, financier, organizer and pioneer promoter of large-scale hydro-electric development, whose death in New York on May 20, at the age of

85, following injury in an automobile accident in South Carolina on March 29, was recorded, with a brief notice of his career, last week (page 934), was born at Boston in April, 1846. He belonged to a well-known family and received his collegiate education at Chauncey Hall School, Boston, and Norwich University, Northfield, Vt., being graduated from the latter as bachelor of science in 1864. After a year in the Massachusetts Institute of Technology, he joined T. J. Lee & Hill, a stockbroking firm in Boston, in 1866 and was subsequently a partner first in the banking firm of Richardson, Hill & Company, Boston, from 1870 to 1878, and then in the firm of Winslow, Lanier & Company, New York bankers, from 1878 to 1893. From 1893 till 1914 he was the American representative of the Deutsche Bank of Berlin. During his New York banking career he was prominently concerned in the reorganization of a considerable number of important railroad and industrial companies and became chairman of the executive committee, the board of directors or other controlling bodies of about a dozen industrial companies and president or vice-president of as many more. His directorships were naturally still more numerous and included the Allis-Chalmers Company, the Bullock Electric Manufacturing Company, the Mohawk Hydro-Electric Company and one of the early Edison illuminating companies in New York.

But Mr. Adams' real distinction—that on which his great reputation was chiefly based—was founded on the development of hydro-electric power at Niagara Falls. He was the author of a history of this epoch-making enterprise in which are related the engineering, financing and political obstacles that had to be overcome, the fight for the adoption of alternating current, the international complications and the final triumph, precursor of the great plants now delivering energy to large territories and extensive industries both in the United States and Canada. Mr. Adams was president of the Niagara Development Company from 1892 to 1920 and of its ally, the Cataract Power & Conduit Company, from 1896 to 1915. Still a director of the Niagara Falls Power Company at the time of his death, he was part and parcel of Niagara's "harnessing," and to tell in detail his activities in those years would be to write again the history of this achievement.

Most recent among the many honors that fell to his lot were the John Fritz medal of the Engineering Foundation in 1926 and his investment as a commander of the Order of the Crown of Belgium in 1928. Previous decorations had been bestowed upon him by France and Germany, and he held honorary degrees from his alma mater, from Columbia University and from the University of Louvain in Belgium. He was a chief factor in the presentation by American engineers to the last-named university of the carillon and clock dedicated on July 4, 1928, and made the speech of dedication.

Mr. Adams had been a trustee, fellow, patron, life member or member of more than 70 artistic, scientific, literary, educational or historic organizations, a donor to the Metropolitan Museum of Art in New York, a member of many clubs of various kinds, and all his life a public-spirited and active citizen. In 1928 he was elected president of the Edison Pioneers. His funeral services in St. Thomas' Protestant Episcopal Church were attended by scores of prominent men—engineers, utility executives and others. He was a widower and is survived by a daughter and by grandsons.

Financial and Statistical News

NEW security issues came into the market in larger volume this week and last after a period of slackness. Totals were about $100,000,000 this week. This suggests a definite improvement in the market for long-term securities. High-grade seasoned bonds in this class have been especially strong recently, but second grade issues have not yet shown any inclination to revive. Some high yields are available in the group.

——UTILITY COMMON STOCKS WERE UNDER PRESSURE THIS WEEK, selling down to new lows in a few cases. These stocks still yield only slightly over 5 per cent on the average, against 8 and even 10 in some other standard groups.

——INVESTIGATION OF BEAR ACTIVITIES BY THE Stock Exchange authorities has fortunately cleared the air somewhat in identifying current selling groups as actual holders rather than the professional short interest, except in a very limited way. Nervous investors collectively mark down their own prices by turning over their stocks, at this stage, to shrewd investors who are said to be accumulating sound issues.

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NEW CAPITAL ISSUES

The Pennsylania Electric Company, formerly the Penn Public Service Corporation, has issued $6,000,000 of 4 per cent first and refunding mortgage gold bonds, series F, due 1971. The sale price is 95¼ and interest, to yield about 4.24 per cent. The purpose of the issue is to reimburse the Associated Gas & Electric Company for funds expended in purchase of properties.

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Dominion Gas & Electric Company, a public utility system providing transportation, gas, electricity and water to parts of Saskatchewan, Alberta and British Columbia, this week sold an $8,000,000 issue of first lien and collateral gold bonds, 6½ per cent series, due 1945. The bonds were offered at 96 and interest to yield over 6.90 per cent. The system is controlled by American Commonwealths Power.

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The largest new issue sold this week is a $60,000,000 issue of 20-year, 4½ per cent gold debenture bonds priced at 101 and interest. Proceeds are to be applied in the discharge of obligations for sums borrowed on short-term notes from the National City Bank of New York, to reimburse the company for expenditures in acquiring capital stock of the New York Steam Corporation and Brooklyn Edison Company and to acquire certain subsidiary stocks.

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An issue of 150,000 shares of $5 cumulative preferred stock, no par value, was sold this week by Public Service Corporation of New Jersey. The offering price (ex dividend, payable June 30, 1931) was $99.50 per share. The proceeds will be used in part to acquire additional common stock of Public Service Electric & Gas Company, an operating subsidiary, thereby providing a portion of the funds for redemption of that company's $6 preferred stock. The balance is to be used for general purposes.

The Nebraska Power Company sold a $16,500,000 issue of first mortgage gold bonds, 4½ per cent series, due 1981, at 102½ and interest to yield 4.37 per cent.

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Public Service Corporation Directorates Change

FOR CONVENIENCE IN OPERATING and to conserve the time of members of the executive committee of the parent company changes were made in the directorates of all the underlying companies of Public Service Corporation of New Jersey at a directors' meeting held last week.

Uzal H. McCarter, Landon K. Thorne, Alfred L. Loomis, John E. Zimmermann, Edward Hopkinson, Jr., and George H. Howard resigned as directors of the subsidiary companies. President Thomas N. McCarter and Vice-Presidents Percy S. Young and Edmund W. Wakelee retained their board memberships and will comprise the executive committee of each of the underlying companies. The vacancies due to the resignations were filled by the election of Edgar Allegaert, George Barker, George H. Blake, Matthew R. Boylan, John A. Clark and John L. O'Toole, present officers of the several companies.

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Ample Funds Available for Utility Financing

WHETHER or not the utility industry will be able, without difficulty, to secure adequate funds for its needs during the remainder of the depression depends on a group of factors largely outside its control. Money market conditions are a factor. The behavior of the securities markets in general is very important. The confidence of the investing public and the attitude of large institutional investors are matters of vital significance. So also is the trend of agitation and promotion for more and more regulation both of holding and of operating companies.

The net effect of current easy money conditions is to reduce the attractiveness of short-term investments to the advantage of longer term securities. This process seems to be under way at present, although definite, sustained strength in long-term bonds is still lacking. For some months, longer term issues with a very satisfactory yield have been neglected in favor of issues expiring in the comparatively near future.

Credit ease speeds refunding

These easy money conditions have the effect of facilitating further refunding. Taking the past 25 years as a background, there would seem to be little probability that the utilities will be able to finance at much lower rates than those now ruling. If the market for new securities should become definitely receptive, with money rates at or near present levels, the near future would be a most opportune time for large-scale financing both for refunding and for construction and development.

Financing operations this year to date have, of course, been well up to normal, but most of it was carried out before the down-turn in the market six weeks ago. Total power and light financing this year to date is close to $600,000,000, out of an announced budget of $894,-

000,000 by the utilities. This is 33⅓ per cent higher than for the same period last year.

While it is impossible to ascertain the actual amount of refunding likely to be carried out this year, it seems a fair assumption that existing low money rates will be the occasion for an extensive amount of this type of financing during the balance of the year. According to the best estimates available, the outstanding bonded debt of the power and light industry is close to $6,000,000,000. A substantial portion of this was sold in periods when money rates were much higher and much of it bears coupons over 5½ per cent. Much of this will be refunded as soon as the market permits. So far this year about 80 per cent of all financing has been for refunding purposes. This amounts to more than $470,000,000 out of the $600,000,000 already referred to and suggests that the other portion of financing, that for new construction, has fallen somewhat behind schedule, if the budget of $894,000,000 is to be adhered to.

Is public confidence warranted?

Does the power and light industry warrant the confidence of the investing public at this time? The answer is that there is no other industry that has so well withstood the ill effects of the depression. The utilities have been called the shock absorbers of industry. While industry as a whole has declined by more than 25 per cent, the power and light companies are probably within 3 per cent of last year's totals. The passing or even cutting of dividends is practically unknown and the cutting down of payrolls has been on a very moderate scale. It is not improbable that the electric utility industry will play a prominent rôle in bringing the country out of the depression. With this favorable record, with reduced operating costs and with a continuation of public confidence resulting therefrom, it seems safe to assume that the industry will have little difficulty in raising its required capital. The big institutional investors, especially insurance companies and savings banks, have large amounts to invest, notwithstanding the depressed condition of business. The savings banks have more to invest now than ever before.

Are there any adverse factors in the current utility situation? It may be urged that the gradual reduction in construction and other costs has led to a shrinkage in equities in plant and equipment. Such plant could be replaced, it may be argued, at a lower cost than the present book value of existing plant.

It seems fair to assume that such a situation is taken care of in the periodic up and down swings of price levels. And it does not seem improbable that prices will follow the trend of all recorded history and swing shortly to higher levels again. There are those who advocate a permanent scaling down of the standard of living. In such an event, a writing down process would be inevitable. Further bonding of the utilities for financing purposes would be difficult with permanently reduced equities. But it is highly improbable that any such situation is in prospect.

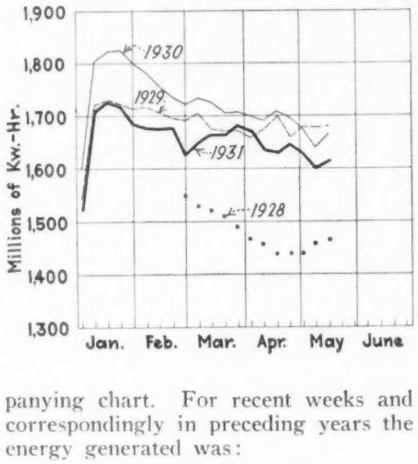
Another factor which some regard as adverse is the agitation for a greater degree of regulation or even of control by the state or federal governments. With regard to this, a recent statement made by Matthew S. Sloan, president of the New York Edison Company, is of interest. Mr. Sloan said:

"There remains only one disturbing possibility, that the people of our country will permit a business which has served them satisfactorily, as is proved by the record, to be scrapped and will turn its job over to government. That I do not for one minute believe. It is contrary to our basic ideas. It is contrary to our experience. We have seen the results of government operation of railroads and shipping during the war period and since. There is no justification for it in logic or in fact. The best government utility operation I know of, the Ontario Hydro-Electric Power Commission and its associated municipalities, does not do as good a job as the nearest comparable utility group in the United States, just across the Niagara frontier.

"The electric utilities are a key business, one on which depend the progress and welfare of our nation. I see for them a future as prosperous as their present, a future of ever-widening usefulness, by which they will earn their prosperity. For all the reasons I have outlined, they are, in my judgment, good investments now, and I am convinced they will not cease to be good investments."

Weekly Energy Output

OUTPUT OF ELECTRIC light and power companies in the United States, as estimated by the statistical research department of the National Electric Light Association, is shown in the accompanying chart. For recent weeks and correspondingly in preceding years the energy generated was:



Week ended	Millions of Kw.-Hr. 1931	1930	1929	1928
April 25	1,647	1,699	1,680	1,440
May 2	1,622	1,672	1,673	1,440
May 9	1,600	1,640	1,677	1,460
May 16	1,614	1,669	1,680	1,470
May 23	1,600	1,673	1,687	1,480

For several weeks the output on the Atlantic Coast has been 3 or 4 per cent greater than last year; on the Pacific Coast the increase was slightly larger; in the central industrial region the level has been quite steadily about 7 per cent below last year's output.

Middle West Raises Per Capita Consumption

AN INCREASE OF 10.6 per cent in the average consumption of electricity per domestic customer of the Middle West Utilities System was announced by C. J. Eaton, vice-president in charge of merchandise and service sales. Owing to rate reductions, revenue per customer increased by only 4.4 per cent. Use per residential customer in 1930 was 469 kw.-hr., against 424 kw.-hr. in 1929. The increase in annual consumption per domestic customer over the past five years was 53 per cent, according to Mr. Eaton.

NEWS BRIEFS

All of the outstanding first lien and refunding mortgage gold bonds, 5½ per cent series, due 1947, of the Philadelphia Electric Company have been called for payment on June 1 at 107½ and interest.

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Pennsylvania Power & Light Company has called for payment June 1 at 105 and interest all of the outstanding first and refunding 6 per cent mortgage gold bonds, series C, due September 1, 1953.

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The formation of R. C. Harvey & Company, Inc., the members of which supply to public utility companies specialized customer-ownership services, including personal field supervision, sales plans and advertising, has been announced. Headquarters have been established in New York. Members of the new organization are Ralph C. Harvey, John G. Crego, E. E. Stewart, V. L. Parmalee and Newell G. Welty, all of whom have been associated in customer-ownership work for a number of years.

Business News and Markets

General Electric Company Pension Payments

THE GENERAL ELECTRIC COMPANY had 1,287 pensioners on December 31, 1930, as revealed by a letter sent to Gerard Swope, president of the company, by Samuel L. Whitestone, chairman of the pension board of the company. During 1930 a total of $903,905 was paid to pensioners.

During the year the pension board granted 84 old-age pensions, 172 optional retirements, ages 65 to 69, and 92 disability relief payments. Sixteen of these 348 employees were women. The number of deaths of pensioners during 1930 was 99. The average age of the pensioners at the end of the year was 69 years and the average pension received was $68 per month. The pension plan of the General Electric Company was announced in 1912, and during the succeeding year $3,691 was paid in pensions. The General Electric pension trust at the close of 1930 had assets amounting to $16,505,000.

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Hammond Clock Earnings Increase Sharply

NET INCOME OF THE Hammond Clock Company for the year ended March 31, 1931, was $507,721, after all charges including depreciation and federal income taxes, equivalent to $5.46 a share on the 93,000 shares of common stock issued and subscribed, the annual report shows. This compares with a net income of $155,937 in the year ended March 31, 1930, equivalent to $1.68 a share on the same basis.

Current assets of the company totaled $859,427, including cash of $228,366, against current liabilities of $289,773. Total assets increased during the year from $722,869 to $1,311,860, while surplus gained from $137,627 to $552,712.

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Exhibition for Electric Heating

AN EXHIBITION DEVOTED exclusively to electric heating is to be held at Essen, the steel city of Germany, during the summer of 1932. Every kind of application is to be represented, from household, space warming and hotel cooking to electric steel furnaces and welding, and including agricultural and electromedical uses.

Separate committees are in charge of the various branches. Preliminary announcements point to a rather elaborate architectural plan, which is largely based on the co-ordination of existing facilities.

The reason given for having the exhibition in 1932 points to a belief that business recovery will just about be under way at that time. "When work takes a fresh start, after the severest economic crisis in the experience of Germany has been overcome, then is the proper time for such an exhibition to assist the rebuilding of the industrial and economic structure with improved methods, new machinery and appliances."

The undertaking is sponsored by a group of prominent organizations, technical, industrial, economic and educational. To carry on the work a special corporation has been formed under the title Elektrowärme-Ausstellung Essen, e.V., with headquarters at the address Märkische Strasse 38, Essen.

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Supreme Court Declares Langmuir Patent Invalid

THE Langmuir radio tube patent (No. 1,558,436) is invalid. So finds the Supreme Court of the United States by unanimous decision in an opinion by Associate Justice Stone reversing a decision of the Third Circuit Court of Appeals. This means that the Langmuir patent of the General Electric Company was not infringed by the De Forest Radio Company. This patent is said to have been the most important item in the patent pool comprising Radio Corporation of America, General Electric Company, Westinghouse Electric & Manufacturing Company, American Telephone & Telegraph Company and General Motors Corporation.

The Langmuir patent was issued late in 1925, when the De Forest patent on vacuum tubes issued in 1906 had expired. In answer to the first suit, the De Forest Radio Company claimed priority of invention and also that the Langmuir patent was invalid for lack of invention and for anticipation by the De Forest patent. This was upheld by the District Court in Delaware, where the suit was originally brought. The decision of this court was first sustained and then, on reargument, overruled by the Circuit Court of Appeals for the Third Circuit, after which the De Forest Radio Company took the case to the Supreme Court.

It was pointed out in the Supreme Court's decision that the production of the high-vacuum tube was no more than the application of the skill of the art to the problem in hand. This is obvious, it was said, when it is realized that the invention involved only the application of this knowledge to the common forms of low-vacuum discharge devices such as the De Forest tubes. The decision reiterated that development of the high-vacuum tube was but the adaptation of the natural developments of the art by those skilled in it to the scientific knowledge which had been accumulated by investigation and experimentation. The court said:

> Once known that gas ionization in the tube caused a regularity of current which did not occur in a high vacuum, it did not need the genius of the inventor to recognize and act upon the truth that a better tube for amplifying could be made by taking out the gas.
>
> Arnold, who was skilled in the art and who had made studies of electrical discharges in high vacua, when shown a De Forest audion for the first time on November 14, 1912, immediately recognized and said that by increasing the vacuum the discharge would be sufficiently stable and have adequate power levels to enable the tube to be employed as a relay device in transcontinental telephony. . . .
>
> Respondent recognizes the force of this objection to patentability, but seeks to avoid it by insisting that the invention claimed is not as we have described it, but that "Langmuir's invention consisted in taking out of the tube the gaseous conductor upon which the prior art relied, and putting nothing—a vacuum—in its place."
>
> It adopts also the statement in the opinion of the court below, upon which its decision turned, "a vacuum, or, indeed, change of vacuum, isolated and standing by itself, is not the Langmuir invention, but it is a working tube in which all the elements, cathode, plate, vacuum, so co-ordinate and interwork that the current flow is not affected by gas," a statement which, as we have already pointed out, takes no account of the scientific knowledge, available before Langmuir, that increase of vacuum in well-known devices was all that was necessary to produce the desired result.

Domestic Service Average Cost Drops Below 6 Cents

ON A NATIONAL AVERAGE, electric current for all domestic purposes broke through the 6-cents-per-kilowatt-hour level in the month of March. The average of revenue ker kilowatt-hour sold now stands at about 5.95 cents, the lowest in the history of the business, according to figures compiled by the statistical research department of the Nation Electric Light Association.

The new figure represents a decline of a full cent per kilowatt-hour, or 14 per cent, since 1926, less than five years. The decline since 1913 is $2\frac{2}{3}$ cents, or 31 per cent.

While rates have steadily decreased, the quantity used by the consumer has gone up. From an average of approximately 270 kw.-hr. per year in 1913, it grew to 427 kw.-hr. at the end of 1926 and is now 559 kw.-hr.

The net result has been an increase of 30 per cent in the amount of electricity used since 1926 by the average housekeeper, although her annual bill has increased only 10 per cent.

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General Electric to Pay Regular Dividends

THE REGULAR QUARTERLY DIVIDENDS of 40 cents a share on common stock and 15 cents on special stock have been declared by the General Electric Company. Both are payable July 25 to stockholders of record June 26.

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TRADE BRIEFS

Utilities Equipment Corporation, Houston, Tex., has been appointed southern Texas agent for the Pinco insulators manufactured by the Porcelain Insulator Corporation, Lima, N. Y.

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Jeffery-Dewitt Insulator Company announces the appointment of the Nelson Electric Supply Company, Inc., as its representative for eastern Oklahoma. H. E. Stockwell has been appointed manufacturer's agent for New England.

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Premax Products, Inc., Niagara Falls, N. Y., which has been in federal receivership since October 20, 1930, has been reorganized and will henceforth operate as Premax Products Corporation.

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Reliance Manufacturing Company of Illinois reports for three months ended March 31 net profit after charges and taxes of $141,265, equal after preferred dividends to 43 cents a share on common stock, compared with $128,819, or 38 cents a share, last year.

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Westinghouse Electric Supply Company has moved from 150 Broadway, New York, to the Westinghouse-Varick Building, 150 Varick Street, New York.

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Link Belt Company announces the appointment of William L. Hartley as district sales manager in charge of the Detroit territory. Mr. Hartley has been in the employ of the company since 1915 and has had a wide experience in the manufacture and sale of its products. His new location will be 5938 Linsdale Avenue, Detroit, Mich.

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New York Metal Prices

	May 20, 1931 Cents per Pound	May 27, 1931 Cents per Pound
Copper, electrolytic	8.75	8.50
Lead, Am. S. & R. price	3.75	3.75
Antimony	6.45	6.40
Nickel, ingot	35	35
Zinc, spot	3.65	3.60
Tin, Straits	23.15	23
Aluminum, 99 per cent.	23.30	23.30

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Electrical Manufacturing at November Level

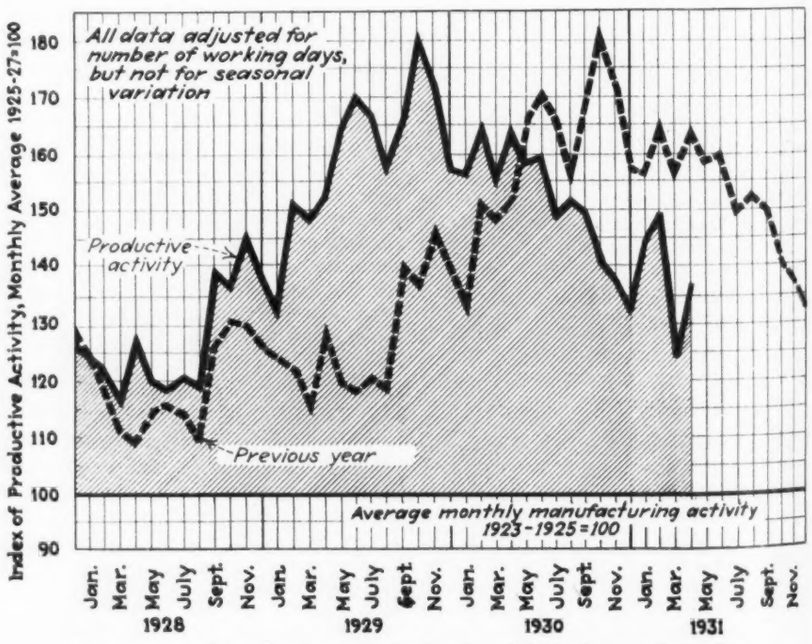
MANUFACTURING of electrical goods during April, as measured by the consumption of energy in plants devoted to this industry, was approximately at the level of last November, 17 per cent lower than at this time last year and 12 per cent lower than in April, 1929. In terms of average daily activity there has been a decline of 2 per cent compared with the first three months of the current year, but an upturn compared with the low point reached in March.

It has previously been stated that this index shows a much later culmination of the rise for the electrical industry than for manufacturing in general, and a less severe decrease. The contrast with the closely related metal-working industry is especially striking. The latter reached its peak early in 1929; it had been declining for eight months before the electrical attained its maximum; its April index shows a drop of 25 per cent from 1930 and 36 per cent from 1929, and so is much in excess of that for electrical manufacturing.

The Midwestern area seems to be a little more active than the Eastern. Again using November as a reference month, neither region shows much change, but in the first named most of the reporting companies show a slight increase, whereas the Eastern companies are, in general, a little below their November figures.

Comparative Index Numbers

April, 1931	136.7
March, 1931	124.3
February, 1931	149.0
January, 1931	144.7
April, 1930	164.9
March, 1930	153.0
Average first four months, 1931	138.7
Average first four months, 1930	159.8



Barometer of productive activity in the electrical manufacturing plants of the United States

Market Conditions

GOVERNMENT and municipal orders are filling the gap in equipment business in the Pacific Coast area, but public funds are short in many districts. Industrial and utility commitments are still on a definitely limited basis. Railroads are in the market in a small way in the Middle West, but utility business is restricted.

——THE EASTERN AND NEW ENGLAND DISTRICTS report a fair volume of equipment orders, especially for substation and line work. Insulator business continues on a high level.

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PACIFIC COAST

—RETAIL SALES HAVE BEEN *curtailed by long vacations and pay cuts, but general business is slowly improving. Wholesalers report fairly steady and well-distributed ordering of staples in medium quantities and construction reports show an increasing number of $50,000 to $250,000 jobs.*

—THE BAY DISTRICT *so far records an even break between this and last year's building permits, while southern California is running about 30 per cent behind last year.*

Country dealers report a marked revival in summer resort and tourist hotel business, owners evidently expecting increased summer business through railroad bargain week-end trips. Furthermore, the Department of the Interior is placing heavy orders through San Francisco for many national parks, running as high as $1,000 to $2,500 worth of wiring and lighting material. Considerable sales and missionary work on lighting playgrounds and recreation areas is hurt through lack of public funds, though the beginning of a new fiscal year on July 1 is expected to make new funds available. The bulk of new building is supplied by moving picture and post office chains, the first including United Artist theaters between Ventura and Palo Alto and averaging $100,000 each and the second another post office group divided equally between the bay area and extreme southern California. Industrial business is slightly better, but on analysis consists of repair or vital maintenance material. Machinery orders include a $30,000 shipment of Westinghouse shovel motors for the Hoover Dam, $25,000 worth of feeder regulators for various central California substations and a $7,500 electrical switchboard, and $65,000 General Electric transformers for Antioch installation, the bulk of the order covering two 10,000-kva.

Production of Pacific Northwest lumber mills remains virtually unchanged, with operations reported as being 45 per cent of capacity and no indications of an early increase. Electrical buying from this source is practically nil, purchases involving minor replacements only. Building construction is also lagging despite low material prices and abundance of efficient labor, the major excuse being difficulty in financing. Last week's motor sales are featured by the purchase from Westinghouse of 50 additional motors by the Longview Pulp & Paper Company, machines ranging from 250 hp. down.

CONSTRUCTION PROJECTS

San Joaquin Valley Walnut Growers' Association, Linden, Calif., plans packing plant to cost $50,000. Publix Garage, Inc., Seattle, Wash., plans multi-story automobile service and garage building to cost $140,000. Bureau of Yards and Docks, Navy Department, Washington, D. C., will receive bids until June 3 for electric traveling cranes for Puget Sound navy yard (Specification 6482). Northwest Chair Company, Tacoma, Wash., plans addition to plant to cost over $75,000. Arizona Compress & Warehouse Company, Coolidge, Ariz., has plans for an addition to cost $100,000. Yuma, Colo., plans extensions and improvements in city light and power plant, including additional equipment.

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SOUTHEAST

—HAND-TO-MOUTH PURCHASING *by central stations pending the revival of industrial activities continues. The volume of business in the Southeast is about as reported for the past several weeks.*

A power company in South Carolina ordered power transformers amounting to $17,500 and a company in North Carolina ordered switchboard equipment costing $10,000. Wire seemed to be an active item last week. A Georgia company ordered 38,000 lb. of bare stranded and weatherproof solid copper and $2,500 worth of guy wire. A North Carolina company ordered 2 miles of submarine cable and an independent telephone company in the same state ordered one car of bare copper wire, while a Florida power company ordered two cars of bare and weatherproof copper and a Georgia municipality purchased 1½ carloads of the same material. A Georgia company ordered insulators amounting to $3,300 and a Florida company ordered $2,000 worth of the same material. An Alabama company bought one carload of pole-line hardware last week, while a Georgia company's creosoted pine pole purchases in the past ten days aggregated $4,800. Some other central-station orders were for $2,700 worth of house type meters and $2,300 worth of lightning arresters. A tobacco company in North Carolina ordered $4,000 worth of switchboard equipment and an industrial in Georgia ordered a small industrial furnace costing approximately $1,000.

CONSTRUCTION PROJECTS

Construction Division, Veterans' Bureau, Washington, D. C., will receive bids until June 23 for refrigerating and ice-making plant, electric elevators, electric distributing system, etc., for institutional project at Huntington, W. Va. Constructing Quartermaster, Fort Monroe, Va., will receive bids until June 15 for fifteen hangars, annexes, etc., at Langley Field, Hampton Roads, Va. Dow Chemical Company, Midland, Mich., contemplates plant at Wilmington, N. C., to cost over $200,000. American Tar Company, Fairfield, Va., contemplates improvements in plant to cost over $150,000.

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MIDDLE WEST

—GENERAL BUSINESS IN THE MIDDLE WEST *section appears to be marking time. Volume is holding up fairly well, but the prospects for a decided improvement are remote. The most that is anticipated at present is a continuance of the present volume with some seasonal decline next month.*

—THE MAJOR INDUSTRIES *are experiencing considerable difficulty in maintaining their position, but there is an increasing degree of optimism, and that in itself is encouraging.*

The automotive industry continues as the bright spot in a rather dull picture. Railroads have resumed their maintenance purchasing to a considerable extent, although purchases are still decidedly restricted. Some increase in the production of electrical energy is observed and quite an amount of electrical equipment and apparatus is on inquiry at this time. Some of the interesting items placed this week include five 92-in. vertical traveling refuse screens complete with appurtenances, 165 heavy-duty pin type pedestal insulators, one 280-volt motor-generator

set and "Mazda" lamps valued at $125,000.

CONSTRUCTION PROJECTS

Detroit Public Lighting Commission, Detroit, Mich., plans two power substations to cost $150,000 and $80,000, respectively, also a machine shop to cost $50,000. Saginaw Malleable Iron Division of General Motors Corporation, Saginaw, Mich., plans expansion program to cost over $100,000. Woodstock, Ill., will receive bids until June 7, for 2,500-kw. turbo-generator set, with direct-connected exciter, switchboard, etc. Ruth Safety Garages, Inc., Chicago, Ill., has plans for a multi-story automobile service and garage building to cost over $850,000. Globe-Wernicke Company, Norwood, Cincinnati, Ohio, is having plans drawn for a power plant at cabinet factory, to cost $225,000. Owens-Illinois Glass Company, Toledo, Ohio, is arranging plans for plant in California, to cost over $1,000,000. Northwestern Public Service Company, Omaha, Neb., has approved plans for power plant at North Platte, Neb., to cost over $250,000.

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NEW ENGLAND

—BUSINESS CONDITIONS IN THIS *district show little change over last week. The trend in orders reported is spotty in all lines. Heavy equipment is dull and interest is centered on projects involving small turbo-generating units, of which there are a number averaging about 200 kw. to be used for institutional needs. Small motor sales, according to one manufacturer, are lagging.*

A number of synchronous motors were purchased for commercial refrigeration purposes. One representative reports an encouraging trend in fractional-horsepower motors and notes more interest in buying on the part of tool manufacturers and refrigerator and oil-burning equipment companies. Central-station supplies are quiet, due to delay in carrying out substation projects in this territory. Scheduled materials are less active and pole-line supplies are in little demand. Domestic appliance sales are off, but interest is maintained in water heaters, which show encouraging gains, one company averaging an order a day, another reporting considerable promise for orders due to a widespread campaign. New construction in this district is largely confined to institutions, particularly hospitals and schools, with a few outstanding government postoffice projects. In addition two large theaters are under way, all of which presages a fair volume of supplies required in new construction building projects.

CONSTRUCTION PROJECTS

Bureau of Supplies and Accounts, Navy Department, Washington, D. C., will receive bids until June 2 for a quantity of insulated cable for Boston, Mass., navy yard (Schedule 5764). Massachusetts Institute of Technology, Cambridge, Mass., plans laboratory units to cost $100,000. Edison Electric Illuminating Company, Boston, Mass., has filed plans for power plant on Kneeland Street, to cost over $250,000.

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EASTERN

—DEMAND FOR ELECTRICAL *equipment continues to maintain a fair level in the Eastern district and manufacturers are securing some worth-while six-figure commitments. Central station business trends to substation and line work; the majority of orders are for such account. Railway and marine equipment shows encouraging features both with regard to immediate orders and future contracts.*

—*Despite anticipations for sustained demand for electrical appliances, the market is lagging and orders are scattered; electric refrigerators, however, are showing an expanding trade and a good season seems just ahead. Electrical jobbers report business as dull, with inquiries giving no signs of early revival.*

Two sizable contracts for network controllers have been secured by a state manufacturer from metropolitan utility companies, one order for Brooklyn, amounting to $80,000, and the other for the Bronx, for $50,000. In connection with a proposed 266,000-kva. power substation near Poughkeepsie, the New York Power & Light Corporation is awarding contracts for cable and other transmission line apparatus. An order has been placed with the Copperweld Steel Company for about 300 miles of copperweld cable, supplementing recent awards for aluminum cable, high-tension insulators and accessory apparatus.

Insulator business continues on a high level and the majority of manufacturers are running at close to capacity. A Baltimore maker has secured an award from the Pennsylvania Railroad for a quantity of insulators for its electrification program; the railroad has active work in progress on this improvement between Manhattan Transfer and Trenton, N. J. The Ohio Brass Company has taken an order for about twelve carloads of insulators and accessory line apparatus from the government of Egypt for electrification projects along the Nile River; the company recently completed a twenty-carload contract for the same account.

The New York Shipbuilding Company, an interest of American Brown Boveri Electric Corporation, is increasing operations at its yard at Camden, N. J., and indications are for continuance for many months. The company has tendered a low bid of $3,150,000 for the construction of a new submarine, SC-5, for the Navy Department, and is expected to secure the award; the vessel is to be completed within 30 months. The building of a similar submarine was started recently at the Navy Yard at Portsmouth, N. H.

CONSTRUCTION PROJECTS

Signal Supply Officer, Army Base, Brooklyn, N. Y., will receive bids until June 8 for armatures, resistors, carbon brushes and other electrical supplies (Circular 166). Sylvania Industrial Corporation, New York, is asking bids for additions to cellulose paper plant at Fredericksburg, Va., to cost close to $1,000,000. Electro-Metallurgical Corporation, New York, has plans for additions to plant at Charleston, W. Va., to cost over $200,000. Department of Docks, New York, is securing fund of $10,330,000 for new piers and equipment. Public Service Electric & Gas Company, Newark, N. J., plans addition to power substation at Irvington, reported to cost over $90,000. National Docks & Terminal Company, Camden, N. J., plans pier, dock and shed to cost $500,000. Reading Company, Philadelphia, Pa., plans car repair shop to cost over $50,000. Department of Commerce, Washington, D. C., will receive bids until June 8 for galvanized skeleton steel towers (Proposal No. 23280); also, on same date for electric code beacons (Proposal No. 23282). General Purchasing Officer, Panama Canal, Washington, D. C., will receive bids until June 3 for motor-generator sets, one five-panel switchboard and other electrical equipment (Panama Schedule 2658).

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SOUTHWEST

—THE SAME STEADY DEMAND *has been maintained during the past week for general stock sizes of apparatus as per previous reports, plainly an indication of buying only actual necessities.*

The only orders of contract size placed in the last week are for oil circuit breakers for automatic switching equipment, $8,000, and equipment for changing several transformers from self-cooled to self- and air-cooled, $4,000. Both these orders are for a local power company. Another is for a bank of transformers for an addition to a manufacturing company, $1,250.

CONSTRUCTION PROJECTS

Ralston Purina Company, St. Louis, Mo., has filed plans for grain elevator to cost $200,000. Salina Grain & Milling Company, Salina, Kan., will take bids for a grain elevator to cost about $175,000. L. F. Boone, Arp, (Smith County), Tex., plans addition to oil topping plant to cost over $90,000. Central Power & Light Company, San Antonio, Tex., has awarded contract for power dam, spillway, etc., for hydro-electric generating plant near Eagle Pass, Tex., to be equipped for capacity of 12,000 hp., estimated to cost $1,000,000. Gulf States Utilities Company, Beaumont, Tex., plans transmission line to High Island oil fields, estimated to cost $85,000.